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Dated: August 29, 1989.

Shirley E. Hollis,
Assistant Secretary.

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Part II

Department of Health and Human Services

Health Care Financing Administration

42 CFR Part 412

**Medicare Program; Changes to the
Inpatient Hospital Prospective Payment
System for Fiscal Year 1990 Rates; Final
Rule**

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Health Care Financing Administration

42 CFR Part 412

[BPD-630-F]

RIN 0938-AE02

Medicare Program; Changes to the Inpatient Hospital Prospective Payment System and Fiscal Year 1990 Rates

AGENCY: Health Care Financing Administration (HCFA), HHS.

ACTION: Final rule.

SUMMARY: We are revising the Medicare inpatient hospital prospective payment system to implement necessary changes arising from legislation and our continuing experience with the system. In addition, in the addendum to this final rule, we describe changes in the amounts and factors necessary to determine prospective payment rates for Medicare inpatient hospital services. In general, these changes are applicable to discharges occurring on or after October 1, 1989. We also set forth the rate-of-increase limits for hospitals and hospital units excluded from the prospective payment system.

EFFECTIVE DATE: This final rule is effective on October 1, 1989, except for 42 CFR 412.116, which is effective September 1, 1989.

FOR FURTHER INFORMATION CONTACT:

John Eppinger—Cancer Hospitals (301) 966-4516.

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SUPPLEMENTARY INFORMATION:

I. Background

A. Summary

Under section 1886(d) of the Social Security Act (the Act), a system of payment for acute care inpatient hospital stays under Medicare Part A (Hospital Insurance) based on prospectively-set rates was established effective with hospital cost reporting

periods beginning on or after October 1, 1983. Under this system, Medicare payment is made at a predetermined, specific rate for each hospital discharge. All discharges are classified according to a list of diagnosis-related groups (DRGs). The regulations governing the inpatient hospital prospective payment system are located in 42 CFR part 412.

B. Summary of the Provisions of the Proposed Rule

On May 8, 1989, we published a proposed rule (54 FR 19636) which set forth changes to the prospective payment system that would be effective for the seventh year of operation of that system, that is, beginning on October 1, 1989. Following is a summary of the major changes we proposed to make to the system:

- As required by section 1886(d)(4)(C) of the Act, we proposed to adjust the DRG classifications and weighting factors for Federal fiscal year (FY) 1990.
- We proposed to update the wage index by basing it entirely on 1984 wage data. In addition, we proposed to make adjustments to the wage data to reflect the provisions of section 1886(d)(8)(C) of the Act, as enacted by section 8403(a) of the Technical and Miscellaneous Revenue Act of 1988 (Pub. L. 100-647).
- We discussed several current provisions of the regulations in 42 CFR part 412 and set forth certain proposed changes concerning—

- Annual publication of prospective payment rates;
- Payment for burn outlier cases;
- Payments to sole community hospitals;
- Beneficiary access to care in rural areas;
- Payments to cancer hospitals;
- Rural referral center criteria;
- Payment for disproportionate share hospitals; and
- Payment for the indirect costs of medical education.

- In the addendum to the proposed rule, we set forth proposed changes to the amounts and factors for determining the FY 1990 prospective payment rates. We also proposed new target rate percentages for determining the rate-of-increase limits for FY 1990 for hospitals and hospital units excluded from the prospective payment system.

- As required by sections 1886(e)(4) and (e)(5) of the Act, in Appendix C of the proposed rule we provided our recommendation of the appropriate percentage change for FY 1990 in the—
- Large urban, other urban, and rural average standardized amounts for inpatient hospital services paid for under the prospective payment system; and

—Target rate-of-increase limits to the allowable operating costs of inpatient hospital services furnished by hospitals and hospital units excluded from the prospective payment system.

- In addition, the proposed rule discussed in detail the March 1, 1989 recommendations made by the Prospective Payment Assessment Commission (ProPAC). ProPAC is directed by section 1886(d)(4)(D) of the Act to make recommendations to the Secretary with respect to adjustments to the DRG classifications and weighting factors and to report to Congress with respect to its evaluation of any adjustments made by the Secretary.

ProPAC is also directed, by the provisions of sections 1886(e)(2) and (e)(3) of the Act, to make recommendations to the Secretary on the appropriate percentage change factor to be used in updating the average standardized amounts beginning with FY 1986 and thereafter. We printed ProPAC's report, which includes its recommendations, as appendix D to the proposed rule (54 FR 1975).

C. Number and Types of Public Comments

A total of 288 items of correspondence containing comments on the proposed rule were received timely.

Approximately one-half of the letters we received were protesting the inappropriateness of the current DRG classification and weighting factors for electrophysiologic studies and automatic implantable cardioverter defibrillator implant procedures. Of the remaining letters, the main areas of concern addressed by the commenters were—

- The 1.35 percent reduction in the DRG weights to account for a portion of the increase in the case-mix index between FY 1986 and FY 1988;

- The proposal to base the wage index on 1984 data only; and

- The revisions made to the wage index for rural counties whose hospitals are deemed urban. The contents of the proposed rule, the public comments, and our responses to those comments are discussed throughout this document in the appropriate sections.

There are four general comments that we are responding to here rather than in the more issue-specific areas below.

Comment: We received one comment expressing concern that HCFA has made no provision for increased costs of care in hospitals and hospital units excluded from the prospective system resulting from the enactment of the catastrophic coverage provisions. The

commenter noted that there should be an adjustment to the target rate to cover increases in the cost per discharge resulting from this legislation.

Response: As we stated on the proposed rule (54 FR 19636), we made revisions to the regulations in the September 30, 1988 final rule to address changes resulting from enactment of the Medicare Catastrophic Coverage Act of 1988 (Pub. L. 100-360). Those revisions included adjustments to the prospective payment system, and the rate of increase ceiling for hospitals and units excluded from the prospective payment system, to take into consideration the reduction in payments to hospitals by Medicare beneficiaries resulting from the elimination of the day limitation on Medicare inpatient hospital services (section 101 of Pub. L. 100-360). Although these changes were final, we allowed a 60-day period for public comment since the changes had not previously been published as proposed. We are developing a final rule that responds to the comments we received.

Comment: One commenter suggested that our proposed changes neglect to address the problems of rural hospitals.

Response: The financial viability of rural hospitals and ensuring access to health care by rural beneficiaries is a matter of highest concern at HCFA. It should be noted that in the proposed rule we strongly urged a higher update factor for rural hospitals (54 FR 19748). We also proposed to ease the requirements and streamline the review process for qualifying as a sole community hospital, as well as liberalizing the requirements for regaining sole community hospital status when a hospital has opted to give up that status (54 FR 19649). We also solicited comments as to how our policies could be changed or improved to assure "essential access" to health care. Finally, we noted in the proposed rule that we are studying long term refinements including the possibility of eliminating separate urban and rural payment rates and revising the payment methodology for sole community hospitals (54 FR 19651).

We believe that these regulatory revisions and the studies we are undertaking demonstrate our commitment to examining the problems of rural hospitals and making appropriate policy changes to the prospective payment system. We reiterate that we believe that changes in Medicare policy alone are not sufficient to assure essential access to rural health care. A viable and effective rural health policy must involve Federal, State and local governments, and private insurers.

Comment: We received one comment noting that the proposed rule did not address payments for capital expenditures. The commenter recommended that payment for capital be set at 100 percent for FY 1990.

Response: We are required by section 1886(g)(1)(A) of the Act to include payment for capital-related costs as part of the prospective payment system for cost reporting periods beginning on or after October 1, 1991. We plan to publish a notice of proposed rulemaking concerning this requirement, which would outline our proposals and request public comment, and to publish a final rule timely. With respect to capital payment for FY 1990, there is no provision in current law for a reduction in payments; however, the Department's budget proposal for FY 1990 contains a provision that would reduce payments for inpatient hospital capital-related costs by 25 percent.

Comment: One commenter was concerned that the proposed rule did not address the treatment of malpractice costs in FY 1990. HCFA has stated, in a HCFA ruling (HCFAR 89-1) issued on January 26, 1989, that the recent court rulings of *Georgetown I* and *Georgetown II* also apply to the treatment of Medicare malpractice costs. HCFAR 89-1 states that the cost of malpractice premiums will be included in base year costs to determine hospital-specific rates for the base period. HCFAR 89-1 also states that future costs of malpractice will be included in hospital administrative and general (A&G) costs. The current hospital cost reporting form 2552 still includes worksheet D-8, which calculates malpractice premiums based on a risk portion and an A&G portion. Since HCFA has stated this method is no longer applicable, the commenter believes that HCFA must detail the treatment of malpractice costs in FY 1990.

The commenter recommends that HCFA publish its policy on changes in the treatment of malpractice costs prior to the final rule on prospective payment system for FY 1990 and allow hospitals adequate time for comment.

Response: In *Bowen v. Georgetown University Hospital, et al.*, 57 U.S.L.W. 4057 (U.S. Dec. 12, 1989) (*Georgetown I*), the Court found that the Secretary was not authorized to issue a retroactively effective rule. It is HCFA's Ruling, in HCFAR 89-1, that the Court's decision in *Georgetown I* controls appeals challenging the 1979 malpractice rule or the 1986 malpractice rule for cost reporting periods beginning before May 1, 1986, provided that these appeals satisfy jurisdictional requirements and

that the hospital did not accept the May 11, 1988 "HHS Settlement Offer—Medicare Malpractice Insurance Costs Litigation" or otherwise settle. Qualifying hospitals will be reimbursed for their malpractice insurance premiums under the utilization reimbursement method in effect prior to the 1979 or 1986 malpractice rules.

It is also HCFA's Ruling that the District of Columbia Circuit Court's decision in *Georgetown University Hospital, et al. v. Bowen*, Nos. 88-5026 and 88-5040 (D.C. Cir. Nov. 15, 1988) (*Georgetown II*) controls pending malpractice insurance cost reimbursement claims under the pre-1979 utilization method for a hospital that did not accept the May 11, 1988 "HHS Settlement Offer—Medicare Malpractice Insurance Costs Litigation." That is, for qualifying hospitals, application of the pre-1979 method to the hospital's malpractice premiums in its prospective payment system base year is applicable to its hospital-specific rate throughout the prospective payment system transition period.

Because *Georgetown I* affects only the Secretary's authority to issue retroactive rules, prospective application of the 1986 malpractice rule (51 FR 11142) for cost reporting periods beginning on or after May 1, 1986, is unaffected by the Court's decision. HCFAR 89-1 does not state, nor was it intended to imply, that the ruling applies to the prospective application of the 1986 rule. Therefore, the current hospital cost reporting forms properly incorporate the methodology to calculate reimbursement for malpractice premiums based on a risk portion and an administrative portion, as provided by the 1986 rule.

II. Changes to DRG Classifications and Weighting Factors

A. Background

Under the prospective payment system, we pay for inpatient hospital services on the basis of a rate per discharge that varies by the DRG to which a beneficiary's stay is assigned. The formula used to calculate payment for a specific case takes an individual hospital's payment rate per case and multiplies it by the weight of the DRG to which the case is assigned. Each DRG weight represents the average resources required to care for cases in that particular DRG relative to the national average of resources used to treat all Medicare cases. Thus, cases in a DRG with a weight of 2.0 would, on average, require twice as many resources as the average Medicare case.

Congress recognized that it would be necessary to recalculate the DRG relative weights periodically to account for changes in resource consumption. Accordingly, section 1886(d)(4)(C) of the Act requires that the Secretary adjust the DRG classifications and weighting factors annually beginning with discharges occurring in FY 1988. These adjustments are made to reflect changes in treatment patterns, technology, and any other factors that may change the relative use of hospital resources. The changes to the DRG classification system and the proposed recalibration of the DRG weights for discharges occurring on or after October 1, 1989 are discussed below.

B. Reclassification of DRGs

1. General

Cases are classified into DRGs for payment under the prospective payment system based on the principal diagnosis, up to four additional diagnoses, and any procedures performed during the stay, as well as age, sex, and discharge status of the patient. The diagnostic and procedure information is expressed by the hospital using codes from the International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM). The intermediary enters the information into its claims system and subjects it to a series of automated screens called the Medicare Code Editor (MCE). These screens are designed to identify cases that require further review before classification into a DRG can be accomplished.

After screening through the MCE and any further development of the claims, cases are classified by the GROUPEER software program into the appropriate DRG. The GROUPEER program was developed as a means of classifying each case into a DRG on the basis of the diagnosis and procedure codes and demographic information (that is, sex, age, and discharge status). It is used to classify past cases in order to measure relative hospital resource consumption to establish the DRG weights and to classify current cases for purposes of determining payment.

Currently, there are 477 DRGs in 23 major diagnostic categories (MDCs). Most MDCs are based on a particular organ system of the body (for example, MDC 6, Diseases and Disorders of the Digestive System); however, some MDCs are not constructed on this basis since they involve multiple organ systems (for example, MDC 22, Burns).

Principal diagnosis determines MDC assignment. Within most MDCs, cases are then divided into surgical DRGs (based on a surgical hierarchy that

orders individual procedures or groups of procedures by resource intensity) and medical DRGs. Medical DRGs generally are differentiated on the basis of diagnosis, age, and presence or absence of complications or comorbidities (hereafter CC) only. Generally, GROUPEER does not consider other procedures; that is, nonsurgical procedures or minor surgical procedures generally not done in an operating room are not listed as operating room (OR) procedures in the GROUPEER decision tables. However, there are a few non-OR procedures that do affect DRG assignment for certain principal diagnoses, such as extracorporeal shock wave lithotripsy for patients with a principal diagnosis of urinary stones.

We proposed to make some changes to the DRG classification system on the basis of problems identified over the past year. These proposed changes and the comments we received concerning them as well as our responses are set forth below. In addition to comments related to each of the specific proposed DRG classification changes, we received some general comments, as follows:

Comment: One commenter indicated that HCFA should have made available to the public at the same time the proposed rule was published the proposed GROUPEER and the maps used to change the FY 1988 diagnosis and procedure codes into their FY 1990 equivalents. The commenter would like this procedure to be followed in future years, also.

Response: Time does not permit us to make the proposed GROUPEER available concurrent with proposed rule. We base our proposed changes on analysis of MEDPAR data received through December of the previous year in conjunction with medical consultation. Once the data are available, there is not sufficient time to perform the analysis, make the changes to the GROUPEER, and then create a new GROUPEER available for public purchase by the publication date of the proposed rule. Changes are not made to the GROUPEER until shortly before publication of the final rule; that is, after all comments have been considered and further analysis has been made based on additional data received through June of the current year.

We believe it is possible for readers who have the current GROUPEER and the MEDPAR data to develop the proposed GROUPEER from the changes and methodology described in the proposed rule and to perform the review and confirm HCFA's projection, as the commenter desires. Thus, we believe that publishing the proposed GROUPEER is not necessary to enable the public to

comment on the significant issues related to DRG classification as set forth in the proposed rule.

With regard to the mapping of the FY 1988 cases into their FY 1990 equivalents, we do not as a matter of policy publish all the material because of the limited interest this material would have for the majority of readers and because of the voluminous amounts of information this would involve. However, this information is available to the public upon request. In addition, the MEDPAR file that was prepared for public release in conjunction with the proposed rule includes in each case its FY 1988 DRG and its proposed FY 1990 DRG assignments.

Comment: One vendor of computer software requested modifications to the GROUPEER software. The commenter believes the GROUPEER should indicate invalid procedure codes in addition to invalid principal diagnosis codes as a means of detecting mapping errors. In addition, the commenter stated that mapped codes are not usually submitted to a validation routine on the GROUPEER or the MCE, and, therefore, a detection ability needs to be added.

Response: Mapping makes diagnosis and procedure codes that change in status (that is, new codes or codes that became obsolete or were revised) equivalent across GROUPEER versions. Mapping is designed by a team of technical analysts, programmers, physicians, nurses, and medical records administrators. The GROUPEER program does not judge the validity of a code; in mapping, the code is renamed so that the case is assigned to the proper DRG in each GROUPEER version. Since both diagnosis and procedure codes and GROUPEER logic may change annually, the GROUPEER software must be redesigned each year based on patient care information.

The GROUPEER overrides an invalid procedure or diagnosis code in many cases by ignoring the invalid code in favor of a coexisting valid code. This can be used to detect incorrect mapping even in an earlier GROUPEER version.

The commenter's belief that mapped codes are not subjected to validation is incorrect. As part of reclassification and recalibration, we test the GROUPEER, by analyzing a sample of MEDPAR cases that contain these mapped codes in order to make sure that the cases are being assigned to the intended DRG.

2. MDC 4: Diseases and Disorders of the Respiratory System

We have received a number of requests from hospitals and other organizations for the expansion of DRG

474 (Respiratory System Diagnosis with Tracheostomy) and DRG 475 (Respiratory System Diagnosis with Ventilator Support) to include principal diagnoses from any MDC when ventilator support is used. In addition, we have received reports of problems experienced by hospitals in the coding and billing of those cases in MDC 4 involving ventilator support.

Beginning with discharges occurring on or after October 1, 1987, cases with a principal diagnosis in MDC 4 and one of the tracheostomy procedure codes (31.1 (Temporary tracheostomy), 31.21 (Mediastinal tracheostomy), or 31.29 (Other permanent tracheostomy)) were assigned to the new DRG 474. Cases involving mechanical ventilation through endotracheal intubation were assigned to the medical DRG 475. DRG 475 included cases presenting a principal diagnosis assigned to MDC 4 and showing non-OR procedure codes 93.92 (Other mechanical assistance to respiration) and 96.04 (Insertion of endotracheal tube). Beginning with discharges occurring on or after October 1, 1988, the title for procedure code 93.92 was revised to "Other mechanical ventilation" and "Continuous positive airway pressure" was assigned a unique procedure code (93.90).

Currently, DRG 475 is assigned to cases with a respiratory system principal diagnosis when neither a temporary tracheostomy nor any operating room procedure is performed and both procedure code 96.04 and 93.92 or 93.90 are performed. The majority of cases involving surgery for respiratory diagnoses are routinely intubated endotracheally, if only on a prophylactic basis. This procedure is considered a part of the surgery and is not normally coded. Assuming that the hospital charges for the procedure, even when it is not coded, the weighting factors for surgical DRGs already account for the resources involved in intubating patients. Thus, DRG 475 was intended to account only for those cases for which there is no surgical procedure and the intubation will be likely to be of longer duration.

The American Association for Respiratory Care, the American College of Chest Physicians, the National Association of Medical Directors of Respiratory Care (NAMDRG), ProPAC, and numerous other commenters have expressed general support for the creation of DRGs 474 and 475. In addition, many commenters at that time encouraged the expansion of the DRGs to include patients with other than respiratory diagnoses. We stated that we would continue our research in this

area, including analysis of superior means of identifying ventilator cases and ways to address this issue in postsurgical cases or for patients with nonrespiratory diagnoses.

We advised the medical community of our intent to target DRGs 474 and 475 for medical review by the Peer Review Organizations (PROs) to ensure that use of the diagnoses and procedures that result in assignment of cases to these DRGs was reasonable and appropriate. In fact, we were not aware of the extent of the problems experienced by hospitals until they were revealed by PRO review. In retrospect, we believe that we should have described in greater detail the situations in which these two new procedure-based DRGs would be assigned. In originally describing these DRGs, we did not reiterate that the necessary procedures had to be performed when the patient was an inpatient of the hospital submitting the bill.

Some hospital staffs believe that the GROUPE logic for DRGs 474 and 475 should be applied whenever prolonged ventilation is involved, regardless of where the intubation or tracheostomy was performed. This is a logical argument, since a hospital will very likely use as many resources in treating a ventilator patient who was intubated or received a tracheostomy in an ambulance or in another hospital's emergency room. Many hospitals requested a waiver of the rules governing billing and payment for inpatient and outpatient services under both parts A and B of Medicare. In the current situation, the stay in a second hospital will not be assigned DRG 474 or 475, respectively, since the procedures necessary for this assignment are not performed on an inpatient of that hospital and, thus, cannot be coded on the hospital's bill.

At least one of the situations that governed the development of these DRGs has changed since October 1987, and we proposed to revise DRG 475 to address the problems that hospitals have experienced with transfer and emergency room patients. As we stated above, procedure code 93.92 was revised beginning with discharges occurring on or after October 1, 1988 to "Other mechanical ventilation." More significant is the fact that continuous positive airway pressure was reclassified to its own code, 93.90, at that time. Since procedure code 93.92 now refers to other mechanical ventilation, we proposed to revise DRG 475 to remove the requirement of the coding of the insertion of an endotracheal tube. This would mean

that cases would be assigned to DRG 475 when a ventilator patient with a principal diagnosis in MDC 4 is intubated elsewhere and no tracheostomy or operating room procedure is performed during the stay at the hospital. When a patient is admitted with an established tracheostomy, the receiving hospital would be paid under DRG 475 if the principal diagnosis is classified in MDC 4, the patient receives mechanical ventilation, and no operating room procedures were performed during the stay in the receiving hospital.

We recognize that ventilator cases in other MDCs tend to be more resource intensive than other cases within the same DRG. There is, however, no agreement as to the mechanism to be used in classifying them. Although NAMDRG has recommended that there be one ventilator DRG for all MDCs with a weight somewhere between that of DRGs 474 and 475, we are concerned that a single ventilator DRG for all MDCs may not be appropriate unless it is based upon an objective measure of the ventilator time involved, independent of the procedures performed.

Studies by the Yale DRG Refinement Project and by Health Systems International (HSI) under its contract with HCFA have both constructed models with DRGs for tracheostomies involving other than MDC 4 cases. We intend to analyze the impact these alternative models would have on the DRG classification system.

Comment: Several commenters expressed support for our proposal to remove the requirement that 96.04 (Insertion of endotracheal tube) must be coded with procedure code 93.92 (Other mechanical ventilation) for a case to be assigned to DRG 475 (Respiratory System Diagnosis with Ventilator Support). One commenter mentioned the need to evaluate whether the payment rate for DRG 475 is adequate for cases involving ventilator patients admitted with an established tracheostomy. However, ProPAC commented that its analysis indicated that the resource costs of the receiving hospital for patients transferred with a tracheostomy were similar to those for transfer cases involving mechanical ventilation without a tracheostomy.

Response: We will continue to monitor DRG 475 to evaluate the impact on the DRG of both removing the requirement that procedure code 96.04 be coded with procedure code 93.92 and of assigning patients admitted with an established tracheostomy to this DRG. However, we note that the information

needed to assign those ventilator patients who were admitted with an established tracheostomy to a different DRG than ventilator patients who were intubated in an ambulance or at another hospital (that is, patients without a tracheostomy) is not available from the inpatient bill. This is because the procedures necessary to make this distinction were not performed during the hospital admission in question and, thus, cannot be coded on the hospital's bill. The bills for both sets of patients will show procedure code 93.92 only.

Comment: We received several comments concerning whether the length of time patients spend on a ventilator should be measured and taken into account in the DRG classification of ventilator patients. Several commenters expressed support for the modification of the existing ventilator procedure codes or development of new codes and DRGs that would reflect the length of ventilator time. However, other commenters opposed adding another digit to the ventilator procedure codes to identify the length of time spent on a ventilator in the belief that it would defeat the purpose of coding classification. That is, these commenters suggested that other data set fields should be used for furnishing this information because a disease classification system cannot provide details of treatment. One commenter suggested that if a length of time indicator is used, the length of time should be defined as the time period from the beginning of ventilation to the final cessation, regardless of any breaks for short periods of time.

Response: The ICD-9-CM Coordination and Maintenance Committee, which has the responsibility for maintaining and updating the ICD-9-CM codes, discussed this issue at its latest meeting, which was held August 10 and 11, 1989. A decision will be made on this issue before next year's ICD-9-CM coding changes are made. Interested parties are encouraged to submit their comments to the Committee at the address below before December 31, 1989.

Comment: Several commenters expressed their opinion that DRGs 474 and 475 should be expanded to include ventilator cases outside MDC 4 because ventilator cases in other MDCs tend to be more resource intensive than other cases in the same DRG. One commenter was concerned that the expansion of DRGs 474 and 475 might be delayed if it were linked to implementation of the recommendations of the Yale DRG Refinement Project.

Response: As indicated in the proposed rule (54 FR 19639), we recognize that ventilator cases in other MDCs tend to be more resource intensive than other cases within the same DRG and we intend to analyze the impact that alternative models for assigning ventilator cases would have on the DRG classification system. This was not, however, an analysis we could complete in time to consider changes in the classification of ventilator cases in FY 1990.

Although one alternative was developed as part of the Yale DRG Refinement Project, it could be implemented independently of the other DRG refinements recommended in the Yale study. Similarly, implementation of other DRG refinements recommended by the Yale study would not necessitate the adoption of the Yale model for ventilator cases should our analysis determine that a different model would be more appropriate.

Comment: One commenter incorrectly interpreted our proposed policy to mean that a ventilator patient who is transferred or intubated elsewhere would still be assigned to DRG 475 if a tracheostomy were performed at the receiving hospital.

Response: The proposed change addressed the situation where a patient in MDC 4 could not be assigned to a DRG 475 because only procedure code 93.92 (Other mechanical assistance ventilation) was shown on the bill. It does not affect the classification of patients in MDC 4 undergoing a tracheostomy at the receiving hospital since these patients would have one of the tracheostomy procedure codes shown on the bill and would continue to be assigned to DRG 474 as before.

As stated in the proposed rule, the receiving hospital would be paid under DRG 475 when a patient is transported with an established tracheostomy or was intubated elsewhere, the principal diagnosis is classified in MDC 4, the patient receives mechanical ventilation, and no operating procedures were performed during the stay in the receiving hospital. We included the criterion that no operating procedures be performed during the stay because patients on mechanical ventilation who receive an operating room procedure are not assigned to DRG 475. We did not intend to imply that those patients who received a temporary tracheostomy, which is a nonoperating room procedure, would also be assigned to DRG 475. Cases with a principal diagnosis in MDC 4 and one of the tracheostomy procedure codes (31.1, 31.21, or 31.29) will continue to be

assigned to DRG 474. We also wish to clarify that cases with code 93.90 (Continuous positive airway pressure) will no longer be assigned to DRG 475 unless the patient also received 93.92 during the stay.

3. Surgical Hierarchies

Some inpatient stays entail multiple surgical procedures, each one of which, occurring by itself, could result in assignment of the case to a different DRG within the MDC to which the particular principal diagnosis is assigned. It is therefore necessary to have a decision rule by which these cases are assigned to a single DRG. The surgical hierarchy, an ordering of groups of procedures from most to least resource intensive, performs that function. Its application ensures that cases involving multiple surgical procedures are assigned to the DRG associated with the most resource-intensive procedure group.

Because the relative resource intensity of procedure groups can shift as a function of DRG reclassification and recalibration, we reviewed the surgical hierarchy of each MDC, as we have for previous reclassifications, to determine if the ordering of procedures coincided with the intensity of resource utilization, as measured by the same billing data used to compute the DRG relative weights.

The surgical hierarchy is based upon procedure groups. Consequently, in many cases, hierarchy has an impact on more than one DRG. The methodology for determining the most resource-intensive procedure groups, therefore, involves weighting each DRG for frequency to determine the average resources for each procedure group. For example, assume procedure group A includes DRGs 1 and 2 and procedure group B includes DRGs 3, 4, and 5, and that the weighting factor for DRG 1 is higher than that for DRG 3, but the weights for DRGs 4 and 5 are higher than the weight for DRG 2. To determine the surgical hierarchy, we would weight the weighting factor of each DRG by frequency to determine average resource consumption for the group of procedures and order the procedure groups from that with the highest to that with the lowest average resource utilization, with the exception of "other (OR) procedures."

The "other OR procedures" group is uniformly ordered last in the surgical hierarchy of each MDC in which it occurs regardless of the fact that the weighting factor for the DRG or DRGs in that procedure group may be higher than that for other procedure groups in the

MDC. The "other OR procedures" group is a group of procedures that are least likely to be related to the diagnoses in the MDC but are occasionally performed on patients with these diagnoses.

Therefore, these procedures should only be considered if no other procedure more closely related to the diagnoses in the MDC has been performed.

Based on the preliminary recalibration of the DRGs, we proposed to modify the surgical hierarchy as set forth below. As discussed below in section II.C. of this preamble, the final recalibrated weights are somewhat different from those proposed since they are based on more complete data. Consequently, we have further revised the hierarchy in this final rule as described below.

We proposed to revise the surgical hierarchy for MDC 5 (Diseases and Disorders of the Circulatory System) and MDC 8 (Diseases and Disorders of the Musculoskeletal System and Connective Tissue) as follows:

a. In MDC 5, we proposed to reorder Cardiac Pacemaker Replacement and/or Revision (DRGs 117 and 118)¹ above Vascular Procedures Except Major Reconstruction Without Pump (DRG 112).

b. In MDC 8, we proposed to reorder Biopsies (DRG 216) above Back and Neck Procedures (DRGs 214 and 215); and we proposed to reorder Arthroscopy (DRG 232) above Major Shoulder/Elbow Procedures or Other Upper Extremity Procedures With CC (DRG 223).

We received no comments concerning the proposed reordering within the surgical hierarchy of MDC 5 and we are making this change as proposed. We did, however, receive one comment on another issue concerning MDC 5 as well as two other comments, one on our proposed reordering of the surgical hierarchy of MDC 8 and one general comment.

Comment: One commenter noted that there were no changes in the number of cases shown on Tables 7A and 7B for DRGs that would be affected by a surgical hierarchy change. The commenter questioned whether the surgical hierarchy changes were reflected in the case counts and relative weights published in the proposed rule.

Response: The surgical hierarchy changes in the proposed rule are based on our preliminary recalibration of the DRG weights. We are not able to test the effects of the revisions and to reflect them in the proposed relative weights

due to the unavailability of revised Grouper software at the time of publication. Rather, in performing analysis of the surgical hierarchies, we simulate most major classification changes to approximate the placement of cases under the proposed reclassification and then recalculate the weights. The weighting factor for each procedure group then serves as our best estimate of relative resource use for that procedure group. We test the proposed surgical hierarchy changes after the revised Grouper is received and reflect the final changes to the surgical hierarchy in the DRG relative weights published in the final rule.

Comment: We received a number of comments questioning the appropriateness of the proposed reordering of DRG 216 above DRGs 214 and 215. The commenters believe that biopsies are less resource intensive than many of the procedures in DRGs 214 and 215.

Response: Although biopsy procedures may be less resource intensive than many of the surgical procedures in DRGs 214 and 215, we proposed the surgical hierarchy change because our data indicated cases requiring a biopsy are more resource intensive than cases in DRGs 214 and 215. Prior to making the surgical hierarchy change, the average standardized charges for cases in DRG 216 were \$700 more than the average standardized charges for cases in DRGs 214 and 215. After reordering the surgical hierarchy, the difference increases to \$1,245. We are making the surgical hierarchy change as proposed so that cases with multiple procedures will be assigned to the higher-weighted DRG; however, we will review the MDC 8 surgical hierarchy again next year.

Comment: We received two comments indicating that the change in the surgical hierarchy order for MDC 5 that was made in the September 30, 1988 final rule (53 FR 38485) and was effective October 1, 1988 has resulted in disputes between PROs and hospital medical records administrators as to the proper sequence for surgical procedures on the Medicare bill. This change was to reorder DRG 108 (Other Cardiothoracic or Vascular Procedures With Pump) above DRGs 106 and 107 (Coronary Bypass). The commenters requested that the surgical hierarchy change be reversed. We received two related comments expressing concern over the limited number of procedure codes that can be shown on the Medicare bill.

Response: The problem identified with DRGs 106 and 108 stems from the procedure code sequencing when more than three cardiac procedures are

performed, including codes 36.10 through 36.19 (Coronary bypass graft). Although more than three procedures may be performed on the patient, only three may be reported on the bill and the DRG assignment and payment are based on the three reported procedures. For example, a patient may have had a coronary bypass graft, but the claim may show only code 37.61 (Pulsation balloon), code 37.21 (Cardiac catheterization), and code 39.61 (extracorporeal circulation). In this situation, the case would be assigned to the higher-weighted DRG 108 instead of DRG 106 or 107.

If there are a greater number of procedures performed than can be listed on the claim, our coding guidelines require that the procedure be reported based on the follow hierarchy:

- Procedures that relate to the principal diagnosis and that affect DRG assignment.
- Other procedures that affect DRG assignment.
- Other procedures which are listed in the ICD-9-CM (Volume 3, Procedures) between code numbers 01.01 and 86.99 which are performed in the operating room.

Based on the coding guidelines, we would normally expect to see the coronary bypass procedure coded on the claim. Although the ICD-9-CM lists code 39.61 as a "code also" peripheral procedure to the coronary bypass procedures, the Grouper logic for DRGs 106 and 107 does not require the coding of the pump for DRG assignment. However, the FY 1989 surgical hierarchy change has created an incentive to leave the bypass procedure off the bill to allow room for 39.61 and other procedures that will result in the case being assigned to the higher-weighted DRG 108. This is a particular problem when a DRG software package is used that contains a resequencing function that will search for codes following the DRG logic trees found in the DRG Definitions Manual. Since the hierarchy change, when procedure codes entered by the hospital's medical records department include codes assigned to DRG 108, the programs will check for code 39.61 (Extracorporeal circulation) before assigning the case to a DRG ranked lower in the hierarchy. Frequently, the procedure codes that are assigned to DRG 108 are incidental to a coronary bypass procedure. In this regard, it is important for users of these packages to be aware of the capabilities of their system and ensure that the sequence of the procedures established by the medical records coder and the

¹ A single title combined with two DRG numbers is used to signify pairs, the first DRG of which is cases with CC and the second of which is cases without CC. If a third number is included, it represents cases of patients who are age 0-17.

attesting physician is the sequence that is ultimately reported on the claim form.

We are aware of the difficulties that have developed in the coding and billing of these DRGs since the surgical hierarchy was changed. We are also concerned over the continued loss of data on the incidence of coronary bypass surgery in conjunction with the cardiothoracic and vascular procedures classified in DRG 108 as well as the loss of clinical coherence as increasingly more coronary bypass cases are assigned to DRG 108. However, we do not believe it would be appropriate to reverse the surgical hierarchy. We made the surgical hierarchy change in FY 1989 because the relative resource intensity of the cases assigned to DRG 108 had increased relative to the weighted average of those cases containing the procedure codes necessary for assignment to DRG 106 or 107. The pre-FY 1989 surgical hierarchy no longer resulted in the assignment of cases involving multiple procedure codes to the DRG associated with the most resource intensive procedure group. The FY 1988 data indicate the DRG 108 cases are still more resource intensive. The average standardized charges for cases in DRG 108, based on the current surgical hierarchy, are \$3,400 higher than the weighted average standardized charges for cases in DRGs 106 and 107. We intend to re-examine this problem as part of our analytic agenda for FY 1991.

Finally, we believe that it would be advantageous to include more fields on the Medicare claim form to allow the hospital to enter both additional diagnoses and procedure codes. We plan to approach the National Uniform Bill Committee this year to request that they revise the Uniform Bill at the next available opportunity. This recommendation will, of course, be subject to the approval of the other members of the committee.

Since we published the proposed rule, we have received a revised GROUPE program and a more complete 1988 Medicare provider analysis and review (MEDPAR) file, and we were able to test the proposed surgical hierarchy changes. Test results indicated that two changes are necessary.

We regrouped the MDC 8 DRGs using the two proposed hierarchy changes to determine whether the standardized charges involved would continue to exceed that of the DRGs that are currently ranked above them in the hierarchy. We found that our proposal to reorder DRG 232 (Arthroscopy) produced anomalous results. We found that the number of patients classified in DRG 232 would increase seven-fold

when the procedure group was moved up in the hierarchy. This result indicates that arthroscopy is more frequently performed in conjunction with a procedure from one of the groups for DRGs 221 and 222 (Knee Procedures), DRGs 226 and 227 (Soft Tissue Procedures), DRGs 230 and 231 (Local Incision and Removal of Internal Fixation Devices), and DRG 228 (Major Thumb or Joint Procedures or Other Hand or Wrist Procedures with CC) than it is performed by itself.

The fact that DRG 232 would pick up so many cases in and of itself is not troubling. However, the reassignment of so many cases results in a weighting factor that no longer supports the proposed surgical hierarchy change. The cases in the FY 1988 MEDPAR that would be assigned to DRG 232 if we changed the order as proposed would have an average standardized charge that would move the DRG back to its current ranking on the surgical hierarchy. It appears that the average Medicare beneficiary who undergoes arthroscopic surgery is often in an advanced stage of degenerative bone or joint disease, resulting in consistently high charges in those cases that do not include other MDC 8 surgeries. The data show that in the situation where arthroscopy is one of multiple procedures performed, the resource intensity of the case is not as high as when arthroscopy is the only procedure performed. Based on these results, we have decided not to implement the proposed reordering of DRG 232.

However, we found from analysis of the revised GROUPE program that another change in MDC 8 surgical hierarchy is necessary due to the revision of the arthroplasty codes and the assignment of the following ICD-9-CM procedure codes to DRG 209 effective October 1, 1989. Currently, all procedures involving shoulder arthroplasty and elbow arthroplasty are assigned to DRG 223 (Major Shoulder/Elbow Procedures or Other Upper Extremity Procedures With CC). With the code revisions, code 81.80 (Total shoulder replacement), 81.81 (Partial shoulder replacement), and 81.84 (Total elbow replacement) will be assigned to DRG 209 (Major Joint and Limb Reattachment Procedures). Consequently, the charges remaining in the cases classified in DRG 223, representing the less complicated arthroplasties, fell to a rank below DRG 231 (Local Excision and Removal of Internal Fixation Devices, Except Hip and Femur). As a result, we are revising the hierarchy in MDC 8 to reorder DRG 223 below DRG 231 and above DRG 228.

Based on these changes, the final MDC 8 surgical hierarchy is as follows:

- Bilateral or Multiple Major Joint Procedures of the Lower Extremity (DRG 471)
- Wound Debridement and Skin Graft Except Hand (DRG 217)
- Major Joint and Limb Reattachment Procedures (DRG 209)
- Hip and Femur Procedures Except Major Joint (DRGs 210, 211, and 212)
- Amputations (DRG 213)
- Biopsies (DRG 216)
- Back and Neck Procedures (DRGs 214 and 215)
- Lower Extremity and Humerus Procedures Except Hip, Foot, Femur (DRGs 218, 219 and 220)
- Knee Procedures (DRGs 221 and 222)
- Soft Tissue Procedures (DRGs 226 and 227)
- Local Excision and Removal of Internal Fixation Devices of Hip and Femur (DRG 230)
- Local Excision and Removal of Internal Fixation Devices Except Hip and Femur (DRG 231)
- Major Shoulder/Elbow Procedures or Other Upper Extremity Procedures With CC (DRG 223)
- Major Thumb or Joint Procedures or Other Hand or Wrist Procedures With CC (DRG 228)
- Arthroscopy (DRG 232)
- Foot Procedures (DRG 225)
- Shoulder, Elbow or Forearm Procedures Except Major Joint Procedures Without CC (DRG 224)
- Hand or Wrist Procedures Except Major Joint Procedures Without CC (DRG 229)
- Other Musculoskeletal System and Connective Tissue OR Procedures (DRGs 233 and 234)

4. Refinement of Complications and Comorbidities List

There is a standard list of diagnoses that are considered complications and comorbidities (CCs). This list was developed by physician panels to include those diagnoses that, when present as a secondary condition, would be considered a substantial complication or comorbidity. A substantial CC, in turn, is defined as a condition that, because of its presence with a specific principal diagnosis, would cause an increase in length of stay by at least one day for at least 75 percent of the patients.

Based upon analysis by our medical consultants, we proposed to eliminate the following minor cardiac block and dysrhythmia diagnoses from the CC list:

- 426.10 Atrioventricular block, not otherwise specified (NOS)
- 426.11 Atrioventricular block, 1st degree

- 426.12 Atrioventricular block—Mobitz (type) II
 426.13 Atrioventricular block, 2nd degree, not elsewhere classified (NEC)
 426.2 Left bundle branch hemiblock
 426.3 Left bundle branch block NEC
 426.4 Right bundle branch block
 426.50 Right bundle branch block NOS
 426.51 Right bundle branch block and left posterior fascicular block
 426.52 Right bundle branch block and left anterior fascicular block
 426.53 Bilateral bundle branch block NEC

Each of these procedures would no longer be considered a CC for any principal diagnosis.

Comment: A number of comments were received recommending retention of some or all of the codes in the CC list or supporting deletion of all of the codes as proposed. One commenter suggested deleting an additional code, 426.9 (Conduction disorder, unspecified). The commenter believes the diagnosis to be rather nonspecific except for interventricular conduction delay (in the alphabetical list of the ICD-9-CM), which is not a significant cardiac defect. In the tabular list (of the ICD-9-CM), however, there are two conditions the commenter believes to be highly significant and suggested interventricular conduction defect may best be reclassified to another ICD-9-CM code.

Response: After further discussion with medical consultants, we agree with several commenters that there may be added risk with diagnosis codes 426.12, 426.13, and 426.53. The remaining codes represent clinical conditions of lesser significance to the patient with acute myocardial infarction, they may or may not be related to the acute myocardial infarction, and they should not cause difficulty in the majority of cases. Therefore, they do not represent comorbidities that can be expected to significantly change resource utilization needs or length of stay. The following is the final list of minor cardiac block and dysrhythmia diagnoses that are deleted from the CC list:

- 426.10 Atrioventricular block, not otherwise specified (NOS)
 426.11 Atrioventricular block, 1st degree
 426.2 Left bundle branch hemiblock
 426.3 Left bundle branch block, not elsewhere classified (NEC)
 426.4 Right bundle branch block
 426.50 Right bundle branch block NOS
 426.51 Right bundle branch block and left posterior fascicular block
 426.52 Right bundle branch block and left anterior fascicular block

We appreciate the commenter's suggestions concerning 426.9, but since

we did not propose to eliminate 426.9, we do not believe it would be appropriate to act on the suggestion at this time. We recommend that the commenter submit it to the ICD-9-CM Coordination and Maintenance Committee for consideration (see address below in section II.B.6. of this preamble).

We proposed a limited revision of the CC Exclusion List, which includes corrections of errors in the existing list, addition of a number of excluded CCs, and the deletion of a number of excluded CCs.

Table 6f in section IV of the addendum to the proposed rule contained the proposed additions to the CC Exclusions List that would be effective for discharges occurring on or after October 1, 1989. The table shows the principal diagnoses with proposed changes to the excluded CCs. Each of these principal diagnoses was shown with an asterisk and the additions to the CC Exclusions List are provided in an indented column immediately following the affected principal diagnosis. The indented diagnosis would not be recognized by the GROUPE as a valid CC for the asterisked principal diagnosis beginning with discharges on or after October 1, 1989.

In the proposed rule, many four-digit diagnosis codes on the master CC list were included on Table 6d (Expanded Diagnosis Codes That Are No Longer Accepted In GROUPE) since they have been replaced by two or more five-digit diagnosis codes. Since the five-digit definitions provide greater specificity in classifying the diagnoses, some of the new codes will no longer describe a CC or will describe a CC in a four-digit category that was not previously on the CC list.

Example

*25060
 34501
 34510
 34511

The four-digit diagnosis code 3450 (Generalized nonconvulsive epilepsy) was not on the master CC list while 3451 (Generalized convulsive epilepsy) was on the list. Code 3451 was excluded as a CC for the principal diagnosis 25060 (Diabetes with neurological manifestations, adult or unspecified onset) for discharges occurring on or after October 1, 1988. Beginning with discharges on or after October 1, 1989, the ICD-9-CM adds a fifth digit designating whether or not intractable epilepsy is involved. The four-digit diagnosis codes are eliminated wherever they occurred on the Exclusion List. Both of the five-digit

codes 34510 and 34511 are added to the Exclusion List in place of 3451. Even though the code 3450 was not considered a CC, 34501 (Generalized convulsive epilepsy with intractable epilepsy) is considered a CC and is added to the master list. Code 34501 will be excluded as a CC for the principal diagnosis 25060.

Comment: Several commenters suggested that codes from the Excludes Note, as set forth in the ICD-9-CM, for diagnosis code 496 (Chronic obstructive pulmonary disease) be added to the CC Exclusions List to improve coding consistency and accuracy.

Response: While we encourage efforts to ensure correct coding and consistent use of ICD-9-CM principles, we do not see the CC Exclusion List as the most appropriate vehicle to ensure this consistency. Furthermore, of the codes mentioned in the Excludes Notes, only two have payment implications and one of these will be changed as of October 1, 1989. However, we understand the commenter's point and as we do more extensive work on the CC list, we will consider ICD-9-CM coding conventions.

Comment: One commenter wanted to know if code 493.20 (Chronic obstructive asthma) will be considered as a comorbid condition and requested clarification regarding the combination of codes 493.90 (Asthma unspecified) and 492 (Emphysema), asking if it becomes part of 493.20.

Response: Diagnostic code 493.20 will be considered as a complication or comorbid condition and will be added to the CC list. The question as to how to code the combination of asthma and emphysema is answered in the final ICD-9-CM coding Addendum for October 1, 1989. Each diagnosis should be coded separately, as they are now.

The only CCs that we proposed to delete from the CC Exclusions List are those deleted diagnosis codes in Table 6d that are currently on the CC list and those diagnosis listed above that we proposed to delete from the main CC list. As proposed, the following diagnoses codes from Table 6d should be deleted from the CC list and wherever they appear on the CC Exclusions List: 345.1; 403.0; 404.0; 410.0-410.9; 411.8; 996.6; and 996.7. For the convenience of the reader, we have included a complete list of the deletions in Table 6g of the addendum to this final rule.

Copies of the original CC Exclusions List applicable to FY 1988 can be obtained from the National Technical Information Service (NTIS) of the Department of Commerce. It is available in hard copy for \$64.95 and on

microfiche for \$18.50. These prices include \$3.00 for shipping and handling. A request for the FY 1988 CC Exclusions List, which should include the identification accession number (PB) 88-133970, should be made to the following address:

National Technical Information Service,
United States Department of
Commerce, Springfield, Virginia 22161;
or by calling (703) 487-4650.

Users should be aware of the fact that both the revisions in Tables 6d and 6e of the September 30, 1988 final rule and those in Table 6f and 6g of this document must be incorporated into the list purchased from NTIS in order to obtain the CC Exclusions List applicable for discharges occurring on or after October 1, 1989. (We do not intend to update the listing available from NTIS to reflect these or any future revisions.)

Alternatively, the complete documentation of the GROPER logic, including the current CC Exclusions List is available from Health Systems International (HSI). HSI, under contract with HCFA, is responsible for updating and maintaining the GROPER program. The current DRG Definitions Manual, Sixth Revision is available for \$195.00, which includes \$15.00 for shipping and handling. The Sixth Revision of this manual includes the changes in this document. This manual may be obtained by writing HSI at: 100 Broadway, New Haven, Connecticut 06511; or by calling (203) 562-2101.

5. Review of Procedure Codes in DRGs 468 and 477

Each year, we review cases assigned to DRG 468 (Unrelated Operating Room Procedures) in order to determine whether, in conjunction with certain principal diagnoses, there are certain procedures performed that are not currently included in the surgical hierarchy for the MDC in which the diagnosis falls. In FY 1989, this review resulted in the addition of two new DRGs: DRG 476 (Prostatic OR Procedure Unrelated to Principal Diagnosis) and DRG 477 (Non-Extensive OR Procedure Unrelated to Principal Diagnosis). For a detailed discussion of the changes, see the September 30, 1988 final rule (53 FR 38487).

Since DRG 468 is reserved for those cases in which none of the OR procedures is related to the principal diagnosis, it is intended to capture atypical medical cases, that is, those cases not occurring with sufficient frequency to represent a distinct recognizable clinical group. DRGs 476 and 477 are assigned to specific subsets of these codes. DRG 476 is assigned to those discharges in which one of the

following prostatic procedures is performed that is unrelated to the principal diagnosis:

60.2—Transurethral prostatectomy
60.61—Local excision of lesion of prostate

60.69—Prostatectomy NEC

60.94—Control of postoperative hemorrhage of prostate

DRG 477 is assigned to those discharges in which the only procedure performed is a nonextensive procedure that is unrelated to the principal diagnosis. In Table 6c in section IV of the addendum to the September 30, 1988 final rule, we listed the ICD-9-CM procedure codes for all of the procedures we consider nonextensive procedures if performed with an unrelated principal diagnosis. These cases are grouped in DRG 477.

Because of the addition of DRG 477, we conducted this year's review of procedures producing DRG 468 or 477 assignments on the basis of volume of cases with each procedure. Our medical consultants then identified those procedures occurring in conjunction with certain diagnoses with sufficient frequency to justify adding them to one of the surgical DRGs for the MDC in which the diagnosis falls. On the basis of this review, we proposed two DRG classification changes in order to reduce unnecessary assignment of cases to DRG 477.

In MDC 14 (Pregnancy, Childbirth and Puerperium), we proposed to add two procedure codes to the operating room procedures in DRG 374 (Vaginal Delivery With Sterilization and/or D&C). Currently these procedures, when combined with a principal diagnosis in MDC 14 such as 665.41 (High vaginal laceration), group to DRG 477. The two procedure codes to be added to DRG 374 are procedure codes 69.09 (Other dilation and curettage) and 69.52 (Aspiration curettage following delivery or abortion).

Comment: Several commenters objected to the addition of procedure code 69.09 (Other dilation and curettage) to DRG 374. The commenters noted that this procedure code should not be used with DRG 374 because there is a specific procedure code (69.02) for D&C following delivery. Since it would be inappropriate to use 69.09 to indicate a D&C following delivery, the procedure code should not be added to DRG 374.

Response: We agree with the commenters that procedure code 69.09 should not be used to code a D&C following delivery and that the correct code would be 69.02. However, the purpose of including 69.09 in DRG 374 is to address those occasions when this

procedure code is nevertheless used with a principal diagnosis assigned to DRG 374. These cases currently group to DRG 477 (Non-Extensive OR Procedure Unrelated to Principal Diagnosis); they more appropriately belong in DRG 374 because 69.09 is not an unrelated procedure. Therefore, we are including procedure code 69.09 in DRG 374.

Comment: We have received several complaints that when splenectomy (codes 41.5 or 41.43) is performed for Felty's syndrome, which is an appropriate procedure for this syndrome, it inappropriately groups to DRG 468 (Extensive OR Procedure Unrelated to Principal Diagnosis).

Response: We agree with the commenters that this is an incorrect grouping and have assigned procedure codes 41.5 and 41.43 to MDC 8 (Diseases and Disorders of the Musculoskeletal System and Connective Tissue) in order to group to the appropriate DRGs 233 and 234 (Other Musculoskeletal System and Connective Tissue OR Procedure).

6. Changes to the ICD-9-CM Coding System.

As discussed above in section II.B.1. of this preamble, ICD-9-CM is a coding system for the reporting of diagnostic information and procedures performed on a patient. In September 1985, the ICD-9-CM Coordination and Maintenance Committee was formed. This is a Federal interdepartmental committee charged with the mission of maintaining and updating the ICD-9-CM. This includes approving new coding changes, developing errata, addenda, and other modifications to the ICD-9-CM to reflect newly developed procedures and technologies and newly identified diseases. The Committee is also responsible for promoting the use of Federal and non-Federal educational programs and other communication techniques with a view toward standardizing coding applications and upgrading the quality of the classification system.

The Committee is co-chaired by the National Center for Health Statistics (NCHS) and HCFA. The NCHS has responsibility for the ICD-9-CM diagnoses codes included in Volumes 1 and 2—Diseases: Tabular List and Diseases: Alphabetic Index, while HCFA has responsibility for the ICD-9-CM procedure codes included in Volume 3—Procedures: Tabular List and Alphabetic Index.

The Committee encourages participation in the above process by major health-related organizations. In this regard, the Committee holds public meetings for discussion of educational

issues and proposed coding changes. These meetings provide an opportunity for input into coding matters from representatives of recognized organizations in the coding fields, such as the American Medical Record Association, the American Hospital Association, and the Commission on Professional and Hospital Activities, as well as physicians, medical record administrators, and other members of the public. Considering the opinions expressed at the public meetings, the Committee formulates recommendations, which then must be approved by the agencies.

The Committee presented proposals for coding changes at public meetings held on April 14, 1988, July 21-22, 1988, and December 1, 1988 and finalized the coding changes after consideration of comments received at the meetings and in writing in the 30 days following the December 1, 1988 meeting. The initial meeting for consideration of coding issues for resolution in FY 1990 was held on April 4, 1989 and a second meeting was held August 10-11, 1989. Copies of the minutes of these meetings may be obtained by writing to the co-chairpersons representing NCHS and HCFA. We encourage commenters to address suggestions on coding issues involving diagnosis codes to:

Ms. Sue Meads, R.R.A., Co-Chairperson, ICD-9-CM Coordination and Maintenance Committee, NCHS, Rm 2-19, Center Building, 3700 East-West Highway, Hyattsville, Maryland 20782.

Questions and comments concerning the procedure codes should be addressed to:

Ms. Patricia E. Brooks, R.R.A., Co-Chairperson, ICD-9-CM Coordination and Maintenance Committee, HCFA, Office of Coverage Policy, Rm 1-J-2 East Low Rise Building, 6325 Security Boulevard, Baltimore, Maryland 21207.

The additional new ICD-9-CM codes that have been approved will become effective October 1, 1989. The new ICD-9-CM codes are listed, along with their DRG classifications, in Tables 6a, 6b, and 6c in section IV of the addendum.

Further, the ICD-9-CM diagnosis codes shown on Table 6d will be expanded to categories requiring a fifth digit for valid diagnosis code assignment. Thus, these diagnosis codes will not be recognized by GROUPE 7 beginning with discharges occurring on or after October 1, 1989. The corresponding five-digit codes are shown in Table 6a. Finally, the ICD-9-CM procedure codes shown in Table 6e will be deleted. These codes were vacated because of the new and revised

codes established by the Committee and will be reserved for future refinements of the ICD-9-CM.

Comment: Several commenters noted errors in Tables 6a, 6b, 6c, 6d, and 6e as set forth in section IV of the addendum to the proposed rule (54 FR 19709-19712). Specifically mentioned was the assignment of procedure codes 77.56 (Repair of hammer toe) and 77.57 (Repair of claw toe) to DRG 63 (Other Ear, Nose, Mouth and Throat OR Procedures).

Response: We have revised Tables 6a, 6b, 6c, 6d, and 6e to reflect the correct spelling, additions, deletions, and DRG assignments. Tables 6a, 6b, 6c, 6d, and 6e should now be correct as set forth in section IV of the addendum to this final rule.

Comment: One commenter asked which of the new diagnosis codes from Table 6a would be added to the CC list.

Response: We have revised Table 6a as set forth in section IV of the addendum to this final rule to add a yes/no column for CCS that will indicate for each of the new diagnoses listed whether or not it is considered a CC.

Comment: Two commenters questioned the assignment of procedure codes 81.57 (Replacement of joint of foot or toe), 81.72 (Arthroplasty of metacarpophalangeal and interphalangeal joint without implant), 81.74 (Arthroplasty of carpocarpal or carpometacarpal joint with implant), and 81.75 (Arthroplasty of carpocarpal or carpometacarpal joint without implant) to DRGs 7 and 8 (Peripheral and Cranial Nerve and Other Nervous System Procedures).

Response: Code 81.57 was incorrectly shown as assigned to DRGs 7 and 8 due to an error in Table 6b in the proposed rule (54 FR 19711). This has been corrected and now is shown assigned to DRG 225 (Foot Procedures) and DRGs 442 and 443 (Other OR Procedures for Injuries) in Table 6b. Codes 81.72, 81.74, and 81.75 are assigned to DRGs 7 and 8 because joint surgery may be performed in a neurologically deficient and unstable hand.

Comment: Three commenters questioned the assignment of code 996.73 (Other complications due to renal dialysis device, implant and graft) to DRGs 144 and 145 (Other Circulatory System Diagnoses). They recommended that it group to DRGs 331, 332, and 333 (Other Kidney and Urinary Tract Diagnoses) because this is a complication of a vascular prosthetic device that is a renal dialysis device.

Response: Code 996.73 is a general category of diagnoses including vascular implants or grafts that may be

associated with many different medical conditions. We find no medical or coding rationale for further DRG differentiation. Code 996.73 will remain assigned to DRG 144 and 145.

Comment: Several commenters supported the new ICD-9-CM codes for intractable epilepsy as a separate diagnosis and the new codes for procedures performed in the diagnosis of people with intractable epilepsy. They stated that by differentiating between intractable epilepsy and routine epilepsy, the new diagnosis codes recognize the varying severity of epilepsy. The commenters also pointed out that these new diagnosis codes will provide the first opportunity to identify this group of patients and to distinguish between routine epilepsy admissions and the far more resource intensive admissions for intractable epilepsy. They recommended that we recognize the far higher cost of intractable epilepsy cases and establish more appropriate payment than exists under the current DRGs. The commenters also expressed concern that insufficient Medicare payments may limit access to needed diagnostic procedures and treatment.

Response: We appreciate the input from these commenters and their support for the new diagnosis codes (345.00 through 345.91) and procedure codes (88.10 and 89.19), as well as their concern and request for further refinements in the classification and payment of intractable epilepsy cases. With these new codes, we will be able to collect and evaluate data concerning resource requirements for patients with intractable epilepsy compared to patients with routine epilepsy and to determine whether any additional classification changes should be proposed.

Comment: One hospital raised a question about the use of the new diagnosis code 411.81 (Acute ischemic heart disease without myocardial infarction) in the case of those patients who had an embolism or occlusion (diagnosed by EKG) but were so successfully treated with tissue plasminogen activator (TPA) or a similar pharmacologic preparation that no infarction resulted.

Response: Clarification of the new diagnosis code 411.81 resolves this issue. This code is for acute ischemic heart disease without myocardial infarction and includes coronary occlusion from embolus or clot formation resulting in ischemia but not infarction.

If a myocardial infarction is diagnosed either by clinical picture, EKG, or enzymes, it qualifies as an acute myocardial infarction and is assigned to

category 410 (fourth and fifth digits are required). The new diagnosis code 411.81 is reserved for those cases in which no myocardial infarction occurs. In cases in which the EKG indicates occlusion with ischemia but without definitive signs of infarction, this patient would be classified under the new diagnosis code 411.81 (Acute ischemic heart disease without myocardial infarction). If TPA were administered, in the absence of a myocardial infarction, 411.81 would be the correct code.

However, if the patient is diagnosed as having an acute myocardial infarction, the case is coded in the 410 category, even if TPA is administered and restores perfusion in the occluded coronary artery.

Comment: Two commenters supported the new diagnosis codes for acute myocardial infarction and the proposed DRG reassignment for myocardial infarction subsequent episode of care cases to DRGs 132 and 133. However, both commenters expressed concern that the FY 1990 DRG weights for DRGs 121 and 122 (Circulatory Disorders with Acute Myocardial Infarction, Discharged Alive) would be too low for acute cases because they are based on all cases currently assigned to these DRGs. The commenters suggested that an adjustment be made in the weights for DRGs 121 and 122 to reflect the reassignment of less resource-intensive cases to DRG 132 and 133. If the weights are not adjusted, one of the commenters suggested leaving the less resource-intensive cases in DRGs 121 and 122 until the DRG reassignment could be reflected in recalibration.

Response: Effective with discharges on or after October 1, 1989, we are requiring the use of a new fifth digit subclassification within the ICD-9-CM category 410 (Acute myocardial infarction). This subclassification distinguishes an initial episode of care from a subsequent episode of care. A fifth digit of "1" (initial episode of care) is used to designate the acute phase of care regardless of the location of treatment. It includes cases that are transferred for care and treatment within the acute phase of care. Any subsequent episode of care for another myocardial infarction is also assigned a fifth digit of "1." All of these cases will be assigned, as they have been in the past, to one of the myocardial infarction DRGs 121, 122, or 123 (or, in the case with pacemaker implantation, DRG 115).

A fifth digit of "2" is used to designate observation, treatment, or evaluation of myocardial infarction within 8 weeks of onset, but following the acute phase, or in the healing state in which the episode of care may be for related or unrelated

conditions. All of these cases will be assigned to one of the atherosclerosis DRGs (132 or 133) if acute myocardial infarction, subsequent episode of care is identified as the principal diagnosis. Our reasons for assigning these cases to the atherosclerosis DRG rather than to a myocardial infarction DRG relate to two of the basic characteristics of the DRG patient classification system. First, each DRG should contain cases with a similar pattern of resource intensity and, second, each DRG should contain cases that are similar from a clinical perspective. We note that cases that would require surgical procedures upon readmission or cases that are readmitted with a complication of myocardial infarction would group to a different MDC 5 DRG.

Without the creation of a new fifth digit subclassification, we would have continued to be unable to distinguish the resource-intensive, clinically-coherent group of patients admitted to the hospital with an acute myocardial infarction from less resource-intensive and clinically-different group of patients who are not suffering an acute myocardial infarction but who are readmitted to the hospital within 8 weeks of a myocardial infarction. Until now, according to ICD-9-CM coding convention, various cases of chronic ischemic heart disease (for example, coronary atherosclerosis) have been classified as acute myocardial infarctions if they occur within 8 weeks of the date of a previous infarction. Thus, cases of acute myocardial infarction have been classified with cases that are not acute myocardial infarctions. This coding convention was developed and is appropriate for mortality reporting purposes but is inappropriate for morbidity reporting purposes. In addition to the problems this coding convention has created for the DRG classification system, it has also distorted the statistical data in the United States concerning the incidence of myocardial infarction.

We believe these problems will be solved by the use of the fifth digit subclassification. However, until the new diagnosis codes are reflected in our MEDPAR data, we are unable to distinguish between the acute and nonacute cases for purposes of recalibration. Thus, as the commenters noted, relative weights for DRGs 121 and 122 are based on the resource requirements for both the high-cost acute myocardial infarction cases and the less resource-intensive nonacute cases that will be paid under DRGs 132 and 133 in FY 1990. The reassignment of the lower cost cases from DRGs 121 and 122 will not be reflected in the DRG

weights until FY 1992, when FY 1990 data will be used in recalibration.

We have not adopted either of the commenters suggested alternatives because they are not consistent with our general policy on reclassification and recalibration. When ICD-9-CM diagnosis codes that affect DRG assignment are added, revised, or deleted, we try to take these changes into account in recalibration. To the extent possible, we convert the existing codes into their equivalents under the revised code definitions so that cases including these codes will be classified in their new DRG assignments before recalibration. When we are unable to determine how cases will be coded under the revised definitions, our policy is to leave the cases in their current DRG assignment for recalibration purposes only. We still assign the codes to the appropriate DRG for payment purposes. Because we are unable to predict which cases will no longer be assigned to DRGs 121 and 122 in FY 1990, we have left all acute myocardial infarction cases in DRGs 121 and 122 in recalibrating the weights. In addition, since we cannot predict which cases will no longer be assigned to DRGs 121 and 122 in FY 1990, we have no basis for determining an appropriate adjustment to the DRG weights for DRGs 121 and 122 to reflect the new DRG assignments.

We believe it would be inappropriate to continue assigning the nonacute cases to DRGs 121 and 122 for payment purposes until FY 1992 because it would result in continued excessive payments for the nonacute cases without improving the payment accuracy for the acute cases in DRGs 121 and 122.

Finally, we note that to the extent DRG reclassification and recalibration contribute to a lower case-mix index value in FY 1990 than we projected in normalization, this effect would be taken into account in any future adjustment for the aggregate effects of the FY 1990 GROUPE changes and recalibration on changes in the case-mix index.

Comment: One commenter expressed opposition to our decision to assign cases involving the readmission of patients within 8 weeks of a myocardial infarction to one of the atherosclerosis DRG (132 or 133) rather than to one of the myocardial infarction DRG (121, 122, or 123). The commenter claims that Medicare patients who have had myocardial infarctions can be expected to have increased admissions in the first four weeks following infarction because of complications. The commenter asserted that the resources required to care for this group of patients increases

because of the recent myocardial infarction and, thus, these cases should be assigned to one of the myocardial infarction DRGs.

Response: We acknowledge that some Medicare patients are at risk of complications in the first few weeks after a myocardial infarction. We believe that the commenter may have misinterpreted the proposed rule in which we indicated in Table 6a that the new codes for myocardial infarction, subsequent episode of care would be assigned to one of the atherosclerosis DRGs (132 or 133). The GROUPEER will only assign these cases to DRG 132 or 133 if myocardial infarction subsequent episode of care is listed as the principal diagnosis. If the patient is admitted with a complication of myocardial infarction, then the complication would be listed as the principal diagnosis and the patient would be assigned to a DRG other than 132 or 133. It should be noted that we have created two new diagnosis codes (429.71 (Acquired cardiac septal defect) and 429.79 (Other certain sequelae of myocardial infarction, not elsewhere classified)) to allow for accurate reporting of complications of myocardial infarction. These codes are assigned to DRG 124, 144, or 145.

Comment: Several commenters opposed the addition of the new procedure codes specific to alcohol and drug detoxification and rehabilitation (94.61 through 94.69) to DRG 433 (Alcohol/Drug Abuse or Dependence, Left Against Medical Advice). These commenters noted that adding these new procedure codes to DRG 433 was unnecessary because the presence or absence of these procedure codes would not affect assignment to DRG 433.

Response: We agree with the commenters that it is unnecessary to add procedure codes 94.61 through 94.69 to DRG 433. A case in which the patient was discharged from the hospital against medical advice will group to DRG 433 regardless of whether detoxification or rehabilitation has been provided. Therefore, we are not adding procedure codes 94.61 through 94.69 to DRG 433. In addition, we are not adding procedure codes 94.62 (Alcohol detoxification), 94.65 (Drug detoxification), or 94.68 (Combined alcohol and drug detoxification) to the GROUPEER logic for DRG 434 or 435. Detoxification procedures should be coded only if provided, but are not required for grouping to DRG 434 or 435. Rehabilitation procedure codes are required for DRG 436; both rehabilitation and detoxification codes are required for DRG 437.

7. Other Issues

a. *Cochlear Implants.* In the September 30, 1988 final rule (53 FR 38476), we agreed to reevaluate the placement of cochlear implant discharges in DRG 49 (Major Head and Neck Procedures) based upon billing data from FY 1988. While cochlear implant cases may not be clinically coherent with other discharges assigned to DRG 49, the FY 1988 Medicare data still do not indicate there would be a material difference in the weighting factors if a separate DRG were created for cochlear implants.

Comment: Several commenters expressed concern that the classification of cochlear implant cases to DRG 49 is inappropriate in terms of both clinical coherency and resource intensity and could limit the availability of cochlear implants to Medicare beneficiaries. One commenter suggested that there are several causes for the low average charges in the MEDPAR data. First, the data reflect the less expensive single-channel device that is no longer manufactured and, as a result, understate the cost of the multi-channel device. Second, the commenter noted that the cost of the device is 84 percent of the charges and maintains that this creates an "expensive device bias" that provides hospitals with little incentive to control the nondevice related expenses and makes cochlear implant procedures not clinically coherent with the other procedures in DRG 49. Finally, the commenter has analyzed the FY 1988 MEDPAR file and alleges that 25 percent of the cases coded as cochlear implants do not reflect the cost of the cochlear implant device. The commenter believes that procedure code 20.96 (Unspecified cochlear implants) has been misused and should be eliminated.

Response: We have re-examined the most recent FY 1988 MEDPAR file and continue to believe that it would not be appropriate to establish a separate DRG for cochlear implant procedures at this time. As indicated in the proposed rule (54 FR 19642), the 113 cases coded as cochlear implants constitute only two percent of the total discharges in DRG 49. Moreover, if we were to remove the cochlear implant cases from DRG 49 and establish a separate DRG based on the FY 1988 MEDPAR data, the weighting factor for cochlear implants would be less than the factor for DRG 49.

We examined the effect the removal of procedure code 20.96 (Implantation or replacement of cochlear prosthetic device NOS) and 20.97 (Single-channel device) would have on the average charges for DRG 49 cases and for cochlear implant cases. We determined

that the removal of either or both of these two procedure codes would have no significant impact of the weighting factor for DRG 49. Further, the average charge for cases coded with procedure code 20.98 (Multi-channel device) is less than the average charge for DRG 49 cases. With regard to the commenter's concern that the average charges may be understated because 25 percent of the cases coded as cochlear implants do not reflect the cost of the cochlear implant device, we can only assume that what a hospital submits as its charges on each bill are in fact the actual total charges for the case. A hospital is under no obligation to show charges equal to or greater than its costs for the services.

Finally, we recognize that some hospitals may be experiencing problems with the coding of cochlear implant cases. As an educational effort to encourage proper use of the cochlear implant codes, we are asking the American Hospital Association to address this issue in their coding publication "Coding Clinic for ICD-9-CM". In addition, we will furnish all Peer Review Organizations with a copy of this document for their consideration in reviewing the proper coding and DRG assignment of cases.

b. *Expansion of the List of DRGs Partitioned by Complications and Comorbidities (CCs).* In the September 30, 1988 final rule (53 FR 38491), we agreed to reevaluate the importance of CCs in DRGs not currently partitioned by the presence or absence of CCs. We have funded a number of studies in recent years designed to evaluate and improve the measurement of hospital case mix. In one recently completed study, Yale University has developed a refined DRG system that differentiates patients within each DRG based on whether they had catastrophic, major, moderate, or minor or no CCs.

The DRG refinement model produces significant improvements in predicting resource use and does not represent a radical departure from the current structure of the DRGs nor does it require the collection of any additional data. Although the results of this study appear promising, we are unable to implement the refined DRG system at this time since the appropriateness of the expanded DRGs has not been confirmed. Also, we need to analyze whether adoption of the refined DRG system would require other conforming changes to the payment system (that is, reestimation of the indirect medical education adjustment factor and the disproportionate share adjustment factor and reevaluation of the need for separate urban and rural rates) in order

to mitigate a potentially large redistribution of Medicare payments across different categories of hospitals. We intend to reevaluate the importance of CCs in the nonpaired DRGs as part of our analysis of the Yale study results.

Comment: One commenter requested information on how many DRGs are defined in the "Refined Yale GROUPE" and its possible use for FY 1991.

Response: Under the Refined Yale GROUPE (the Yale model), a patient is first assigned to an MDC based on his or her principal diagnosis code. Then, if the patient had a temporary tracheostomy (except for patients assigned to MDC 3 or MDC 15) or died within 2 days of admission (medical patients only), the case is assigned to a tracheostomy or early death group. The MDCs in the Yale model are identical to the MDCs defined GROUPE 6 (effective October 1, 1988).

A patient not classified as "temporary tracheostomy" or "early death" is assigned to one of 317 subgroups (referred to as ADRGs) based on his or her principal diagnosis (medical hospitalization) or major procedure performed (surgical hospitalization). Finally, patients in each of the medical and surgical ADRGs are divided into final groups (RDRGs) based on classes of additional diagnoses. The classes for medical cases represent subsets of additional diagnoses on the GROUPE 6 comorbidities and complications (CCs) list to indicate a major, moderate, and minor or no effect on resource use. Surgical classes represent those cases with a catastrophic, major, moderate, or minor or no effect on resource use. Patients with no additional diagnoses are assigned to the class with minor or no effect on resource use.

This assignment algorithm applies to all MDCs except MDC 3 and MDC 15. In MDC 3 (Diseases and Disorders of the Ear, Nose and Throat), only medical patients can be assigned to the initial tracheostomy group. In MDC 15 (Newborns and Other Neonates with Conditions Originating in the Perinatal Period), a model specific to neonates was developed. Excluding MDC 15, there are a total of 1,126 refined DRGs: 167 medical ADRGs with three classes; 145 surgical ADRGs with four classes; 22 early death groups; 22 temporary tracheostomy groups; and one group for discharges with ADRGs 468, 469, 470, 476, and 477.

We are continuing to evaluate the Yale recommendations and to assess the most appropriate DRG groupings as part of our ongoing research concerning potential methodologies for incorporating severity measures into the prospective payment system. We have no plans to implement the Yale model in

FY 1991. However, it is possible that selected aspects of the system (for example, the method for assigning ventilator patients) could be implemented independently of the rest of the Yale model if our analysis indicates that they are the preferred models for classification.

c. Limb Salvage Surgery. In the September 30, 1988 final rule (53 FR 38483), we stated that we had become involved in a broad analysis of the classification of certain major cardiovascular procedures that could potentially result in the restructuring of DRG 108 (Other Cardiothoracic or Vascular Procedures With Pump), DRG 109 (Other Cardiothoracic Procedures Without Pump), DRGs 110 and 111 (Major Reconstructive Vascular Procedures Without Pump), and DRG 112 (Vascular Procedures Except Major Reconstruction Without Pump). This analysis evolved from our ongoing DRG refinement analysis.

The problem that has been observed is that the DRG system provides the same payment to hospitals for patients who require an arterial reconstruction for intermittent claudication as it does for those patients who require the same kind of operation for limb threatening ischemia (that is, for gangrene, a nonhealing ischemic ulcer, or severe ischemic rest pain).

Based on our review of these cases, we have not determined if this problem can be solved through a change in the GROUPE logic. Since the same surgical procedure is performed for each group, it is impossible to differentiate on that basis alone.

It appears from all the data we have analyzed thus far that we are dealing with different quantities that legitimately fall under virtually identical categories in the ICD-9-CM. Different surgeons are performing the same basic procedures on patients who fall at the opposite ends of the range in severity of the manifestations of peripheral vascular disease. The GROUPE program can assign only the codes listed on the billing record, and the distinguishing secondary diagnoses of gangrene and decubitus ulcers are perhaps not shown as often as they actually occur. As long as the procedures involved are found to be medically appropriate, it would be contrary to one of the basic premises of the prospective payment system to create expensive and inexpensive subcategories of cases exhibiting similar ICD-9-CM coding.

Therefore, although we will continue to examine this issue, we did not propose to make any changes to DRGs 108 through 112.

Comment: Several commenters expressed concern that continued inadequate payment for limb salvage cases could limit the availability of the procedure and create incentives to perform amputation. One commenter recommended that cases in DRG 110 (Major Reconstructive Vascular Procedure Without Pump With CC) be differentiated based on whether there is a gangrenous lesion that could lead to amputation of the limb. This change would not require modification of the procedure codes.

Response: We will continue to analyze the cases in DRG 110 with attention to the classification change suggested by the commenter.

d. Reassignment of Patients with Guillain-Barre Syndrome. Guillain-Barre syndrome is a postinfectious polyneuropathy in which patients may require plasmapheresis, ventilation assistance, and long intensive-care stays. Guillain-Barre syndrome discharges have been assigned to DRGs 18 and 19 (Cranial and Peripheral Nerve Disorders). ProPAC believes that the classification of Guillain-Barre syndrome cases into DRGs 18 and 19 is inappropriate in terms of resource use; that is, the average resource use associated with Guillain-Barre syndrome cases is higher than the resource use for average cases in DRGs 18 and 19. In its recommendation 13, ProPAC recommended that the Secretary reassign patients with Guillain-Barre syndrome from DRGs 18 and 19 to DRG 20 (Nervous System Infection Except Viral Meningitis) and DRG 34 (Other Disorders of Nervous System With CC); alternatively, a new DRG could be established.

As we stated in the proposed rule, we are unable to evaluate the appropriateness of a classification change for Guillain-Barre syndrome patients without further analysis of the FY 1988 MEDPAR data. Moreover, the issue of whether reclassification to DRGs 20 and 34 would be clinically consistent warrants further examination. We will examine this issue as part of our ongoing DRG refinement analyses.

Comment: ProPAC expressed concern that, given the magnitude of differences between costs for Guillain-Barre cases and other cases with cranial and peripheral nerve disorders in DRGs 18 and 19 (Cranial and Peripheral Nerve Disorders) found in its analysis of FY 1987 MEDPAR data, it was unclear why HCFA feels analysis of FY 1988 data is required before a classification change can be proposed. ProPAC believes that the prospective payment system must be

sufficiently flexible to correct payment inequities in a timely fashion.

Response: When possible payment inequities are brought to our attention, we try to analyze and respond in a timely fashion. However, ProPAC's recommendation concerning alternative classification methods for Guillain-Barre cases was not presented to us until March 1, 1989. This did not provide adequate time to investigate the issue thoroughly and to analyze the appropriateness of the alternative classifications suggested by ProPAC before publication of the proposed DRG changes and relative weights.

While we appreciate and welcome ProPAC's analyses of DRG classification issues, ProPAC's studies do not relieve us of our responsibility to analyze the data and other evidence that would support a classification change and to determine the impact the change would have on the affected DRGs.

Our review of the FY 1988 MEDPAR data since publication of the proposed rule confirms ProPAC's finding that Guillain-Barre cases are more resource intensive than other cases within the same DRG. As we indicated in the proposed rule, we will examine the issue of the appropriate DRG classification for these cases as part of our ongoing DRG refinement analyses.

e. Electrophysiologic studies. In the September 30, 1988 final rule, we discussed our inability to determine whether electrophysiologic (EP) studies should be treated as OR procedures in order to have an effect on DRG assignment. (53 FR 38488.) We stated that the FY 1987 MEDPAR data indicated that the incidence of EP studies was too small to warrant differential payment. We encouraged hospitals to code EP studies on their billing forms so that we might conduct a more thorough analysis of this procedure.

Comment: The American College of Cardiology, a number of cardiologists and electrophysiologists, and a major health industry manufacturer objected to the continued treatment of procedure code 37.26 (Cardiac electrophysiologic stimulation and recording studies) as a non-OR procedure since this would mean that this procedure would continue to have no effect on DRG assignment.

A majority of the commenters believe that EP studies should be treated as either a cardiac catheterization or an OR procedure for the purpose of DRG assignment. Although generally performed in a catheterization laboratory or radiology suite rather than in an operating room, EP studies involve significant levels of time and resources

in managing patients with potentially life-threatening cardiac arrhythmias. Multiple drug testing in cases that do not ultimately involve surgery can involve stays of over 2 weeks in length.

Response: EP studies and cardiac mapping were previously identified temporarily under procedure code 37.29 (Other diagnostic procedures on the Heart) long with HIS Bundle until October 1, 1988 when the distinct ICD-9-CM procedure code for EP studies became effective. EP studies have been used since the early 1980's to determine the appropriate antibrillation agent to be prescribed for patients with inducible cardiac arrhythmias. In the absence of verifiable data under the temporary code, we reasoned that the cost of EP studies should have already been reflected in the relative weights of both the medical and surgical DRGs in which such cases had been classified.

In our analysis of this issue as presented in the September 30, 1988 final rule, we concluded that the number of cases available for review from the FY 1987 MEDPAR file was too small to warrant differential payment and that there are sufficient numbers of other cases to average out payments (53 FR 38489). To the extent that EP studies occurred much more frequently than our data suggested, we encouraged hospitals to record these codes on their billing forms so that we might conduct a more thorough analysis of these procedures in the future. At that time, however, we believed it was inappropriate to construct a new DRG or to test EP studies as an OR procedure.

We now have been able to analyze the bill data for a portion of FY 1989 for DRGs showing procedure code 37.26. We believe it supports the comparability of EP studies to cardiac catheterization procedures in terms of resource use and time required. Based on this analysis and the concurrence of our medical staff, we are making a number of changes in the DRG assignment of procedure code 37.26 for discharge occurring on or after October 1, 1989.

We found code 37.26 in 1.0 percent of the available FY 1989 data for DRGs 138 and 139. Although this is not a great increase, we believe that it is significant that over 80 percent of the codes were shown in medical DRGs. (We would not necessarily expect to find EP studies coded on surgical bills because in the limited space available, there are procedure codes that are much more likely to be coded if performed because, unlike EP studies, these other codes may affect DRG assignment.)

Therefore, based on public comment and our analyses, in MDC 5, DRGs 104 and 106, we are adding 37.26 to the

listing of nonoperating room procedures. In DRGs 108 and 112, we are adding 37.26 as a nonoperating room procedure. This HSI Definitions Manual will show this as: Or, NON-OPERATING ROOM PROCEDURE, 3726 Cardiac electrophysiologic stimulation and recording studies. (The code will be shown in the short description.)

We have determined from our discussions with a manufacturer of the automatic implantable cardioverter defibrillator (AICD) that the EP studies performed during the implantation, revision, or replacement of an AICD is considered to be a part of the procedure and thus would not be coded in addition to the AICD procedure codes (37.94-37.98). The HCFA representatives on the ICD-9-CM Coordination and Maintenance Committee and the Editorial Advisory Board of AHA's "Coding Clinic" intend to publish information to clarify the use of this code in its new classification.

f. Automatic Implanted Cardioverter Defibrillator (AICD).

Comment: The manufacturer of the automatic implanted cardioverter defibrillator (AICD) system currently available recommended three specific changes in the DRG assignment of the AICD procedure codes as follows:

- Cases in which a patient undergoes initial AICD system implantation and EP testing should be classified into DRG 104 (Cardiac Value Procedure With Pump and With Cardiac Catheter).

- When a total AICD system is implanted in two stages on different days in the same hospitalization (that is, the lead system is implanted on one day and the AICD device is implanted on a subsequent day), the case should be assigned to DRG 104.

- AICD replacement cases should be moved from DRG 120 (Other Circulatory System OR Procedures) and be reassigned to DRG 109 (Other Cardiothoracic Procedures Without Pump).

The commenter submitted a contractor study that concluded that the average standardized charges for AICD replacement cases are understated in the FY 1987 MEDPAR file. Based on a survey of physicians and hospitals that perform this procedure that analyzed the 167 AICD replacement cases in the FY 1987 MEDPAR file, the contractor found that—

- 31 percent of the cases were from hospitals that had never purchased an AICD device, which implies that the ICD-9-CM coding shown on the claim is not correct;

- 6 percent of the cases were not AICD replacements but nevertheless

were from hospitals that purchased and implanted AICD devices; and

- 8 percent of the cases were from hospitals that undercharged or never charged for the device.

We also received a large number of comments from physicians and organizations that made the same recommendations.

Response: We agree that when a patient undergoes complete baseline EP testing to determine the proper treatment of their cardiac arrhythmias ultimately receives a defibrillator implant in the same admission, that discharge should be assigned to DRG 104. Accordingly, as discussed above, we have added EP testing as a nonoperating room procedure to DRG 104.

In response to the suggestion concerning AICD systems that are implanted during two separate operations on different days in the same hospital stay, we had not previously classified these cases in DRGs 104 and 105 for two reasons. We did not have data for either the separate initial implant or replacement of a defibrillator device and leads in our data base. Additionally, our medical staff and consultants were not convinced that this technique of separate operations is widely practiced. Thus, the ICD-9-CM procedure codes 37.95 (Implantation of automatic cardioverter/defibrillator lead(s) only) and 37.96 (Implantation of cardioverter/defibrillator pulse generator only) are assigned to DRG 120 (Other Circulatory System OR Procedures). Code 37.95 is currently included on the Medicare Code Editor (MCE) list of noncovered OR procedures.

It is our understanding that medical records administrators would not generally substitute code 37.94 (Implantation or replacement of automatic cardioverter/defibrillator, total system [AICD]) for the two separate procedures because it would not represent the events involved in the patient's treatment. We have not previously found cases with the two initial implant codes nor have we found the two replacement codes (37.97 and 37.98) in combination in prior data bases. However, the FY 1988 MEDPAR data include one case with a two-stage initial implant and three cases with a two-stage replacement.

Even though it seems to be rare in the Medicare population, we agree that if an entire system is implanted or replaced in separate stages of the same admission, it should be assigned to DRG 104 or DRG 105. Therefore, we are removing code 37.95 from the MCE noncovered procedure edit and adding the following

code pairs to the OR procedure list for DRGs 104 and 105:

- 37.95 and 37.96
- 37.97 and 37.98

With regard to the classification of replacement or insertion of AICD leads or pulse generator alone, we continue to believe that placement in DRG 120 is appropriate for these procedures. Our analysis of the FY 1988 MEDPAR data for DRG 120 indicates that the standardized charges for cases with the code for replacement of an AICD lead or pulse generator alone is more than \$3,000 lower than the standardized charge for the DRG. In addition, the standardized charge for the DRG is \$14,250 compared to the \$15,000 minimum cost estimated in the contractor's study for an AICD replacement case in FY 1987 (based on the cost of the device and a 2-day hospital stay). Even allowing for inflation, the estimated cost for the replacement cases is well within the variation in charges for DRG 120.

The commenter's recommendation to reassign the AICD replacement cases to DRG 109 is based on comparing the average weight for DRG 109 with an imputed weight for the AICD replacement cases based on the cases in the study with the average charges in excess of \$15,000 and imputed charges for those cases in which the hospital implanted the device but undercharged or did not charge for the device. The imputed charges were based on the cost of the device plus a 14 percent markup. We do not believe it is appropriate to make DRG classification changes using imputed charges in this manner. We can only assume that what the hospital submits as its charges on each bill are in fact the actual total charges. A hospital is not under any obligation to show charges equal to or greater than its costs for services.

Finally, we share the commenter's concern that the procedure codes for AICD replacement should be properly used. Therefore, we will furnish the information provided by the commenter about potential improper coding to the PRO's for their review.

g. Tissue Plasminogen Activator (TPA).

Comment: A commenter expressed concern that the recalibration process does not account adequately for the costs incurred by hospitals in using tissue plasminogen activator (TPA). The commenter requested an adjustment in the weights to ensure that the use of TPA is adequately reflected and recommended further analysis of the DRG classification for patients with acute myocardial infarctions to ensure

that the DRGs consist of homogenous groupings based on clinical and cost criteria.

Response: As indicated in the September 30, 1988 rule 53 FR 38491, we believe that the update factors provided for in section 1886(b)(3)(B)(i) of the Act and the annual recalibration process provide sufficient recognition of the cost of TPA. Since the recalibration process uses actual charges, hospital resources directly associated with TPA in FY 1988 were used in the calculation of the DRG weights. In this regard, the costs of the drug may be offset by shorter hospital stays.

With regard to the DRG classification of patients with acute myocardial infarctions, we note the change we are making that is effective for discharges on or after October 1, 1989 to assign the less resource-intensive patients who are not suffering an acute myocardial infarction but who are readmitted to the hospital within 8 weeks of a myocardial infarction to one of the atherosclerosis DRGs (DRG 132 or 133) should improve the clinical homogeneity of the acute myocardial infarction DRGs (DRGs 121, 122 and 123). As data reflecting this change become available, we will review the appropriateness of the DRG assignments as part of our ongoing review of the DRG classification system.

h. MDC 8: Diseases and Disorders of the Musculoskeletal System and Connective Tissue.

Comment: We received one comment concerning DRG 209 (Major Joint and Limb Reattachment Procedures) and DRG 471 (Bilateral or Multiple Major Joint Procedures of Lower Extremity). The commenter asserted that, in terms of weighting and classification, the prospective payment system has not kept pace with technological advancements connected with these two DRGs. The commenter stated that there are two variations in joint replacement surgery that are more costly than the average joint replacement surgery case: one that involves the use of a porous-coated prosthesis and the other is revision joint replacement surgery. The commenter recommended that we analyze our data to determine whether they support the addition of a new DRG for porous-coated joint replacement surgery and a new DRG for revision joint replacement surgery.

Response: The commenter raises a new issue concerning DRGs 209 and 471 that was not discussed in the proposed rule. With regard to the variations in joint replacement surgery described by the commenter, several coding changes have been made (see Tables 6b and 6c as set forth in the addendum to this final

rule) that will be effective for procedures performed on or after October 1, 1989. Basically, the codes no longer differentiate between procedures in which cement is used and those in which it is not. However, new codes were added and revisions to existing codes were made to better identify and separate revision joint replacement surgery cases from initial joint replacement surgery cases. We will evaluate the effect of these coding changes on DRG assignment and weights after data reflecting these changes become available.

i. Autologous Bone Marrow Transplantation.

Comment: One commenter addressed the methodology for classifying autologous bone marrow transplants and the payment levels of DRG 394 (Other OR Procedures of the Blood and Blood Forming Organs), DRG 400 (Lymphoma and Leukemia with Major OR Procedure), DRG 406 (Myeloproliferative Disorder or Poorly Differentiated Neoplasm With Major OR Procedure with CC), and DRG 407 (Myeloproliferative Disorder or Poorly Differentiated Neoplasm With Major OR Procedure without CC) in which most autologous bone marrow transplant cases would be assigned. The commenter submitted its study of operating costs and Medicare payments for autologous bone marrow transplants. The findings of this study suggest there is a significant classification problem with autologous bone marrow transplant cases with the existing DRGs and that this problem results in very significant losses to hospitals.

The commenter pointed out that because there is no unique DRG for bone marrow transplants, these cases are placed in the same DRGs as much less resource intensive cases, and as a result of averaging, the bone marrow transplant cases will be underpaid. The commenter stated that the difference between costs and the low Medicare payment level provides significant disincentives for hospitals to perform autologous bone marrow transplants for Medicare patients. The commenter expressed concern that hospitals that perform autologous bone marrow transplants could be forced to shift costs to other programs or payers and that access to bone marrow transplants might be reduced for Medicare patients due to inadequate payment policies.

Response: The commenter has raised an issue that was not discussed in the proposed rule. Medicare began coverage for autologous bone marrow transplants on April 28, 1989. Our methodology for classifying and determining the weight for bone marrow transplants cases is the

same as the methodology for all other nonorgan transplant cases. (The Medicare manual issuances (Medicare Hospital Manual Transmittal No. 566, published in June 1989 and Medicare Intermediary Manual Transmittal No. 1426, published in May 1989) that announced our coverage of autologous bone marrow transplants contained some errors concerning payment for these bone marrow transplants. We incorrectly stated that bone marrow acquisition costs are paid on a reasonable cost basis; however, this is incorrect as this cost is included in the prospective payment amount. Also, physician services are billed under Part B at 80 percent of the reasonable charge as determined by the Medicare carrier (rather than 100 percent as stated in the manual issuances).)

Bone marrow transplants cases will be assigned to existing DRGs until data on Medicare patient experience is developed that indicate that a separate DRG would improve both clinical coherence and homogeneity with respect to resource use for a new DRG. Since coverage of the procedure was established only in April 1989, limited data will be available for analysis in the coming year. However, we will review the available data and, in doing so, we will take into account the commenter's findings.

j. GROUPE E codes.

Comment: One commenter recommended that the GROUPE E be modified so that E codes, which are used to classify external causes of injury and poisoning, will not affect DRG assignment of cases in MDC 15 (Newborns and Other Neonates with Conditions Originating in Perinatal Period). The commenter pointed out that cases in MDC 15 with E codes are assigned to DRG 390 (Neonates with Other Significant Problems) and recommends that the GROUPE E be modified to eliminate this problem even though this is not a major problem for Medicare's population since the GROUPE E is used by payors other than Medicare.

Response: We agree that the GROUPE E should not assign MDC 15 cases with an E code to DRG 390. We will address this problem in next year's GROUPE E changes; that is, the DRG reclassification changes effective for FY 1991.

k. Thoracoabdominal Aortic Aneurysm (TAAA) Repair.

Comment: A commenter expressed concern that the level of resources associated with TAAA was not properly recognized by the current DRG classification system. The commenter noted that the September 30, 1988 final

rule (53 FR 38483) had indicated that we would continue to review the classification of this procedure but that we had not addressed the issue in the May 8, 1989 proposed rule. The commenter suggested that the prospective payment system, which operates on the law of averages, discourages specialization even though there is no evidence that high-volume hospitals have lower complication and mortality rates.

Response: Currently, TAAA repairs are classified in DRG 108 (Other Cardiothoracic or Vascular Procedures with Pump) and DRG 109 (Other Cardiothoracic Procedures without Pump). During FY 1988, there were 69 cases in DRG 108, the same number as in FY 1987. During FY 1988, there were 293 cases in DRG 109, an increase of approximately seven percent over the number of cases in FY 1987. TAAA repairs account for approximately two percent of all cases in these DRGs. Further, analysis of the coefficient of variation for TAAA repairs shows a much higher variable in charges within the TAAA cases than within DRGs 108 and 109.

As we noted in the September 30, 1988 final rule (53 FR 38483), we are not generally persuaded that such small numbers warrant special treatment in the context of a system built on averages. While analysis indicates that cases with TAAA procedures appear to consume more resources than the average case in DRGs 108 and 109, there is no evidence that providers of these services are suffering a financial hardship as a result of performing these services.

l. Percutaneous Transluminal Coronary Angioplasty (PTCA). In the course of analyzing the DRG logic for DRGs 106, 107, and 108 (see discussion on surgical hierarchy for MDC 5 in section II.B.3., above), we noted a problem with the assignment of percutaneous transluminal coronary angioplasty (PTCA) (procedure codes 35.96 through 36.05). PTCA involves the insertion of a catheter in the arm or leg that is passed into the vessels that supply the heart muscle. Although PTCA is comparable clinically in resource intensity to other cardiac catheterization procedures, it is not listed as a cardiac catheterization in DRG 106 (Coronary Bypass With Cardiac Catheterization). As a result, if PTCA is performed but the patient still requires coronary bypass surgery (and does not receive another cardiac catheterization procedure), the case will be assigned to the lower-weighted DRG 107 (Coronary Bypass without Cardiac Catheterization). Even

though we did not propose a change in the PTCA assignment, we are assigning PTCA as a cardiac catheterization procedure to DRG 106 in this final rule. The title "Non-Operating Room Procedures" is being changed to "Cardiac Catheterization Procedures" in the GROUPE definitions for DRG 106. Given the comparability of PTCA with other cardiac catheterization procedures, we believe it would be inappropriate to delay implementation of this change for another year. We note that only a small number of cases will be affected by this change.

C. Recalibration of DRG Weights

One of the basic issues in recalibration is the choice of a data base that allows us to construct DRG relative weights that most accurately reflect current relative resource use. Since FY 1986, the DRG weights have been based on charge data. The latest recalibration, which was published as a part of FY 1989 prospective payment final rule, used hospital charge information from the FY 1987 MEDPAR file. For a discussion of the options we considered and the reasons we chose to use charge data beginning in FY 1986, we refer the reader to the rules published on June 10, 1985 (50 FR 24372) and September 3, 1985 (50 FR 35652).

We proposed to use the same basic methodology for the FY 1990 recalibration as we did for FY 1989. That is, we recalibrated the weights based on charge data for Medicare discharges. However, we used the most current charge information available, the FY 1988 MEDPAR file, rather than the FY 1987 MEDPAR file. The MEDPAR file is based on fully-coded diagnostic and surgical procedure data for all Medicare inpatient hospital bills.

The proposed recalibrated DRG relative weights were constructed from FY 1988 MEDPAR data received by HCFA through December 1988 from all hospitals subject to the prospective payment system and short-term acute care hospitals in waiver States. That MEDPAR file included data for approximately 9.7 million Medicare discharges (erroneously indicated as 9.5 million in the proposed rule). The MEDPAR file updated through June 1989 includes data for approximately 10 million Medicare discharges and this is the file used to calculate the weights set forth in Table 5 of the addendum to this final rule.

The methodology used to calculate the DRG weights from the FY 1988 MEDPAR file is as follows:

- All the claims were regrouped using the revised DRG classifications

discussed above in section II.B. of this preamble.

- Charges were standardized to remove the effects of differences in area wage levels, indirect medical education costs, disproportionate share payments, and, for hospitals in Alaska and Hawaii, the applicable cost-of-living adjustment.

- The average standardized charge per DRG was calculated by summing the standardized charges for all cases in the DRG and dividing that amount by the number of cases classified in the DRG.

- We then eliminated statistical outliers using the same criterion as was used in computing the current weights. That is, all cases outside of 3.0 standard deviations from the mean of the log distribution of charges per case for each DRG were eliminated.

- The average charge for each DRG was then recomputed excluding the statistical outliers and divided by the national average standardized charge per case to determine the weighting factor.

- We established the weighting factor for heart transplants (DRG 103) in a manner consistent with the methodology for all other DRGs except that the heart transplant cases that were used to establish the weight were limited to those Medicare-approved heart transplant centers that have cases in the FY 1988 MEDPAR file.

- Kidney acquisition costs continue to be paid on a reasonable cost basis but, unlike other excluded costs, kidney acquisition costs are concentrated in a single DRG (DRG 302, Kidney Transplant). For this reason, it was necessary to make an adjustment to prevent the relative weight for DRG 302 from including the effect of kidney acquisition costs, since these costs are paid separately from the prospective payment rate. Kidney acquisition charges were subtracted from the total charges for each case involving a kidney transplant prior to computing the average charge for the DRG and prior to eliminating statistical outliers.

- Heart acquisition costs, like kidney acquisition costs, continue to be paid on a reasonable cost basis and are similarly concentrated in a single DRG (DRG 103, Heart Transplant). Accordingly, for the heart transplant cases in the updated MEDPAR file used for recalibration, we subtracted from the total charges of each case an estimate of heart acquisition charges prior to computing the average charge for the DRG and prior to eliminating statistical outliers, identical to the adjustment we make for removing kidney acquisition charges from cases in DRG 302. For additional information about the methodology for estimating heart

acquisition costs, see the September 1, 1987 final rule at 52 FR 33037. In the proposed rule, we indicated that if adequate heart acquisition charge data were available from the bills used to determine the final DRG weights, we would use the actual heart acquisition charges in establishing the final FY 1990 weight for DRG 103. Our analysis indicates there were 110 cases in DRG 103 in the updated MEDPAR file. However, only eight of these cases had heart acquisition charges shown on the bill. Given the discrepancy between the total number of cases in the DRG and the number of cases with heart acquisition charges, we have decided to continue to estimate heart acquisition charges rather than to use the limited charge data reported on the MEDPAR file.

When we recalibrated the DRG weights for FY 1986, FY 1988, and FY 1989, we set a threshold of 10 cases as the minimum number of cases required to compute a reasonable weight. In FY 1989, there were 35 DRGs that contained fewer than 10 cases. We proposed to use that same case threshold in recalibrating the DRG weights for FY 1990. In the FY 1989 recalibration, we computed the weight for the 35 low-volume DRGs by adjusting the original weights of these DRGs by the percent change in the weight of the average case in the remaining DRGs. We proposed to use this same methodology for the FY 1990 recalibration. Using the FY 1988 MEDPAR data set, there are 27 DRGs that contain fewer than 10 cases.

ProPAC, in its March 1, 1988 report, had recommended that the DRG weights be recalibrated annually on the basis of costs rather than charges. However, ProPAC indicated concern about the Medicare cost-finding methods for estimating costs because the limitations of the Medicare cost report data may in some cases produce imprecise DRG weights. In the May 27, 1988 proposed rule, we indicated that we would examine the feasibility of adopting cost-based DRG weights (53 FR 19507).

Accordingly, we contracted with the Rand Corporation to evaluate both methodologies to determine which provided the better measure of resource consumption across DRGs. While there were noted differences in the recalibration results using each methodology (that is, charge-based weights resulted in higher weights for surgical DRGs and lower weights for medical DRGs, on average, relative to cost-based weights), Rand found no conclusive evidence favoring one methodology over the other. We continue to believe that the

disadvantages associated with charge-based weights are compensated for by the fact that, for purposes of recalibration, charge data are available on a more timely basis than cost data. For example, for the recalibrated weights for FY 1990, we are using FY 1988 Medicare billing data from the MEDPAR file. However, we have yet to obtain a full file of FY 1987 Medicare cost reports. Thus, any cost data we were to use for recalibration would be at least 1 year and perhaps as much as 2 years older than the most recent available charge data.

In addition, since costs are not accumulated on an individual case basis, DRG by DRG, it is necessary even in developing cost-based weights to link ancillary charge data from the claims file to cost report data as part of the process of estimating the average costs of cases in each DRG. In an attempt to make more timely estimates of costs, ProPAC also proposed in its March 1, 1988 report that the latest cost report data be used in conjunction with the most recent patient bills. However, as noted in the Rand study, this mismatch of data might cause distortions in estimating costs because it assumes that per diem costs rise uniformly across hospitals and that cost-to-charge ratios remain constant over time. In order to maintain consistency and to determine relative resource use accurately, we believe that charge data for the same period as the cost data should be used in cost-based recalibration. Therefore, if we were to recalibrate on the basis of costs, both the charge and cost data that would be used would be significantly older than the most recently available charge data.

We believe that using old data is inappropriate, particularly given the rapid advances in medical technology and resulting changes in treatment patterns. We further believe that it is in the best interest of the hospitals and Medicare beneficiaries that the resource use associated with these major new medical advances be reflected in the DRG weights as soon as possible. This can be accomplished by the use of charge-based weights computed on an

annual recalibration schedule. We are concerned that use of cost-based weights would significantly delay recognition of new technologies or greatly complicate the recalibration process by necessitating a number of special adjustments to take such new technologies into account. Therefore, absent conclusive evidence that cost-based DRG weights provide a better measure of resource consumption across DRGs, we proposed to continue using charges as the basis for recalibrating the DRG relative weights.

The purpose of making changes in the DRG classifications and weights is to reflect changes in the relative resource costs across DRGs. Thus, the changes are intended to affect the relative distribution of payments across DRGs and should not affect aggregate payments to hospitals under the prospective payment system. Each time we have recalibrated (beginning with the first recalibration in FY 1986), we have normalized the new weights by an adjustment factor intended to ensure that recalibration by itself neither increases nor decreases projected total payments under the prospective payment system. With normalization, the average case weight after recalibration equals the average case weight prior to normalization for the same set of cases.

The case-mix index is a measurement of the average DRG weight for a given set of cases. In theory, any changes in the average case-mix index value for Medicare cases after recalibration and implementation of the new GROUPE and corresponding DRG weights should be attributable to an increase in the complexity of cases that are treated or to coding changes. However, our analysis indicates that the case-mix index value for FY 1988 cases is higher when those cases are processed with the FY 1988 GROUPE than when the same cases are processed with the FY 1986 GROUPE. This demonstrates that changes we made to the GROUPE program between FY 1986 and FY 1988 inflated the case-mix index and, therefore, program expenditures.

Several changes were introduced into the GROUPE 4 program used to pay for discharges in FY 1987. These changes, which are discussed in detail in a June 3, 1986 final notice on changes to the DRG classification system (51 FR 20192) and the September 3, 1986 final rule (51 FR 31476), included the following:

- Creation of a new DRG for extensive burns with a burn-related operating procedure.
- Elimination of age considerations from the criteria for classification of two pairs of DRGs in MDC 8 (Diseases and Disorders of the Musculoskeletal System and Connective Tissue).

Changes that were made in the GROUPE 5 program used to pay for discharges in FY 1988 are discussed in detail in a September 1, 1987 final notice on changes to the DRG classification system (52 FR 33143). The most significant of these changes were—

- Creation within MDC 4 (Diseases and Disorders of the Respiratory System) of two new DRGs for tracheostomy and mechanical ventilator cases;
- Reconfiguration of the alcohol and drug DRGs;
- Elimination of age over 69 as a criterion for classification in all of the pairs of DRGs in which age over 69 and/or CC was a factor; and
- Changes to the CC list.

We analyzed the changes in the case-mix index between FY 1986 and FY 1988 because the FY 1986 cases were used to recalibrate the DRG weights in the GROUPE 5 program, which, in turn, was used to pay the FY 1988 cases that are being used to recalibrate the FY 1990 weights that will be used with GROUPE 7. To the extent that the DRG classification changes and relative weights contributed to the increase in the case-mix index, an adjustment should be made to the FY 1990 weights in order not to build the inflated FY 1988 case weights permanently into the average case weight values.

Our analysis indicated that there was a total increase in the case-mix index of 6.4 percent between FY 1986 and FY 1988, as follows:

CASE-MIX INDEX CHANGE—FYs 1986-1988

Fiscal year	Number of discharges	GROUPE version	Case-Mix index ¹	Percent increase over FY 1986
1986	8,842,953	3	1.2045	
1987	9,501,374	4	1.2367	2.7
1988	9,142,064	5	1.2824	6.4

¹ Index values reflect GROUPE version and MEDPAR data set appropriate to each year.

We analyzed the case-mix change in order to determine what portion of the increase was attributable to changes made in the GROUPER program from FY 1986 to FY 1988.

To evaluate this question, in the proposed rule, we used each of the three GROUPER programs to process and classify the bills from the FY 1988 MEDPAR. In order to process the FY

1988 cases through the earlier GROUPER versions, FY 1988 diagnostic and surgical codes were remapped into their FY 1987 equivalents prior to being processed with GROUPER 4. These codes were then remapped into their FY 1986 equivalents prior to being processed with GROUPER 3. Since the same FY 1988 cases were processed through each of the GROUPER versions,

we assumed that any differences in the average case-mix index values between the three GROUPER versions are attributable to recalibration and the changes in the GROUPER program.

We found that the FY 1988 case-mix index value was 1.35 percent greater when the cases were processed using GROUPER 5 than when using GROUPER 3, as shown below:

EFFECT OF GROUPER VERSION ON FY 1988 CASE-MIX INDEX

	FY 1988 discharges	Case-Mix Index ¹	Percent difference from GROUPER 3
GROUPER 3.....	9,142,064	1.2653	
GROUPER 4.....	9,142,064	1.2696	.34
GROUPER 5.....	9,142,061	1.2824	1.35

¹ Represents FY 1988 MEDPAR run through each GROUPER version.

Based on this analysis, we concluded that, of the total increase in the case-mix index value from FY 1986 to FY 1988 (that is, 6.4 percent), 1.35 percent was the result of recalibration and changes made to the GROUPER program.

In normalization, we compare the average case weight before recalibration (for FY 1990, this is determined by mapping the FY 1988 claims into their FY 1989 equivalents and processing them through GROUPER 6) to the average case weight after reclassification and recalibration. Based on the above analysis, we proposed to reduce the average case weight by 1.35 percent. Without this adjustment, we would build into the FY 1990 weights an inflated average case-weight value. We did not propose to recover the excess payments that have already been made based on the inflated weights; however, it would be inappropriate to continue to pay based on these weights. Therefore, we proposed to normalize the FY 1990 weights by an adjustment factor so that the average GROUPER 7 case weight after recalibration is equal to the average GROUPER 6 case weight prior to recalibration reduced by 1.35 percent.

We received many comments from the public on the adjustment to the DRG weights, as well as many comments on DRG recalibration in general. The specific comments and our responses follow.

Comment: Many commenters supported our policy of using charge data to recalibrate the DRG weighting factors. However, several commenters stated that we should use cost data in lieu of charges when recalibrating the DRG weights.

Response: We addressed the issue of recalibration based on cost data versus charge data in detail in the May 27, 1988 proposed rule (53 FR 19507) and the September 30, 1988 final rule (53 FR 38492). We continue to believe that while, in principle, recalibration based on cost data is preferable for calculating DRG weights, in fact, there is no choice but to rely heavily on charges. The reason is that ancillary "costs" are just ancillary charges adjusted by cost-to-charge ratios. Since both "cost" and "charge" weights are very dependent on the charge data, the co-called "cost" weights are subject to many of the same limitations as the "charge" weights. Charge data, unadjusted by cost report data on cost-to-charge ratios, only lag a year behind the current fiscal year; however, cost data lag at least 1 year and up to 2 years behind the latest available charge data. Although we are attempting to accelerate the process for submitting and reviewing cost report data, there is an inherent limitation in this process in that cost reports cannot be submitted until after the end of a cost reporting period. We continue to be concerned that using older cost data would delay the recognition of new technologies and changes in medical practice patterns.

Finally, we are sensitive to the criticism expressed by some that cost-based weights are more compressed than charge-based weights, so that the use of charges tends to favor more costly, high technology services, which are more often furnished in urban hospitals. Nevertheless, we believe that the advantages of timely charge data outweigh the disadvantages discussed

above that are inherent in the use of cost data.

Comment: One commenter opposed the lower relative weight for DRGs 336 and 337 (Transurethral prostatectomy) as set forth in the proposed rule. In addition to the commenter's opposition to the overall 1.35 percent reduction (included in a separate comment and response, below), the commenter believes that any reduction in the weight of these DRGs would only increase the amount of the underpayment to hospitals for these two DRGs. The commenter provided copies of an audit of 11 Medicare and seven non-Medicare transurethral prostatectomy cases discharged within a 3-month period during FY 1989. The commenter compares the hospital's charges to the wage-adjusted DRG payment that the hospital received with no adjustment for teaching costs or the additional cost of treating a disproportionate share of low-income patients.

Response: The commenter has expressed a basic misconception that a hospital's charges for services are comparable to the amount of Medicare prospective payment system payments to the hospital. The Medicare program has never paid on the basis of charges for inpatient services (except that, under the reasonable cost payment system, allowable costs could not exceed the hospital's charges). Moreover, the prospective payment system payment does not include capital and other pass-through costs. Therefore, an accurate comparison cannot be made between a hospital's charges for a case and the Medicare payment in order to determine the amount that payment exceeded or fell short of the cost of treating that

case. For example, we adjusted the average of the charge amounts presented by the commenter by the appropriate Statewide urban cost-to-charge ratio as set forth in Table 8 of the addendum to the September 30, 1988 final rule (53 FR 38628). The adjusted average amounts were very close to the applicable DRG payment amounts cited by the commenter.

With respect to the commenter's concern regarding adequate payment for transurethral prostatectomy cases under the prospective payment system, we must reiterate that the prospective payment system is not designed so that the payment received covers the full cost of every discharge. A hospital's payment may be greater than its costs for some DRGs and less than its costs for other DRGs. While the Medicare prospective payment amount may not cover the complete cost of care for some cases that develop complications or involve more severe illnesses or multiple procedures, there are likely to be many cases in which the Medicare payment exceeds the cost of treating the patient, and the excess payments received in these cases should offset these higher cost cases. Thus, the prospective payment system is intended to provide an incentive for hospitals to manage their operations more efficiently by evaluating those areas where increased efficiencies can be instituted without adversely affecting the quality of care and by treating a mix of cases so that payment in excess of cost on one DRG will offset costs in excess of payment of another DRG.

Comment: We received a large number of comments questioning our authority to impose an across-the-board reduction in the DRG weights in order to correct for increases in the case-mix index resulting from changes in the DRG classification system and recalibration. Many commenters stated that the update factor is the traditional vehicle for incorporating coding effects into the prospective payment system and suggested that HCFA was, in effect, making an adjustment for case-mix increase twice; once in the weights and again in the update recommendation. The commenters also noted that since Congress has eliminated HCFA's discretion in setting the update factor, the decision to reduce the DRG weights by 1.35 percent is HCFA's attempt to circumvent congressional intent.

Response: We believe that the reduction in the DRG weights is necessary in order to maintain budget neutrality, and that we have the authority to make appropriate adjustments to the DRG weights to

ensure that any changes in the DRG classifications and weights do not affect aggregate payments to hospitals under the prospective payment system. Section 1886(d)(4)(A) of the Act requires the Secretary to establish a classification system for measuring relative resource consumption using diagnosis-related groups and a methodology for classifying specific inpatient hospital discharges within these groups. Section 1886(d)(4)(C) of the Act requires that these classification and weighting factors be adjusted annually beginning in FY 1988 "to reflect changes in treatment patterns, technology, and other factors which may change the relative use of hospital resources."

Since changes in the DRG classifications and weighting factors are intended to account for "relative" changes in resource consumption across DRGs, we believe it is implicit that any reclassification or recalibration, or both, of the DRGs should not influence aggregate payments to hospitals. Changes in the DRG classification system and the DRG weights are intended only to redistribute prospective payments among cases and should not increase or decrease total payments. Without the reduction in the DRG weights, we would build the inflated DRG weights resulting from changes in the classification system and recalibration into the FY 1990 prospective payment system payments.

With regard to those commenters who stated that the update factor is the vehicle that should be used to account for the effect of changes in the case-mix index on aggregate payment levels, we disagree with respect to the effects of reclassification and recalibration changes. When the increase in the case-mix index is directly related to reclassification and recalibration of the DRG system, we believe it is more appropriate for the adjustment to be made in the DRG weights as an integral part of the recalibration process. We note that our update recommendation does not include this increase as a factor of consideration.

Comment: A few commenters expressed concern that a reduction in all DRG weights would have a greater effect on hospitals with a low case-mix index value than those with higher values. At least one commenter believes that .0135 would be subtracted from each DRG weight.

Response: We are implementing an across-the-board percentage reduction in the DRG weights. The impact of this reduction will fall equally on all hospitals as a percentage reduction in their average case weight and will not

be proportionately greater for hospitals with low case-mix index values.

Comment: Several commenters argued that the 1.35 percent reduction is inappropriate because GROUPE changes are made to better account for actual resource use on very costly cases and that an increase in the average case-mix index value across GROUPE versions should be an expected result. Other commenters expressed concern that the methodology used to arrive at the 1.35 percent reduction appears to discount changes in case mix, either real or related to coding, that could not be identified and measured with GROUPE 3. Once commenter suggested that some of the case-mix increase may reflect the ability of the GROUPE improvements to capture some of the increase within DRG complexity. This commenter argues that this increase represents a real increase in patient resource requirements that justifies an increase in hospital payments.

Response: The purpose of the GROUPE changes is to improve the way past cases are classified to measure relative resource consumption in establishing the DRG weights and the way current cases are classified for payment purposes. In the year in which the change are made, they are intended to be budget neutral; that is, the payments in that year should be no more or no less than the payments would have been without the changes. We proposed the 1.35 percent reduction in DRG weights because our analysis indicated that of the total increase in the case-mix index value between FY 1986 and FY 1988 (that is, 6.4 percent), 1.35 percent (about one-fifth of the total increase) resulted from the GROUPE changes and recalibration in those years. No adjustment in the DRG weights was proposed for the remaining increase in total case-mix.

To the extent the classification changes capture differences in relative resource consumption that were not previously measured (such as increases in DRG complexity) and as the frequency of the more resource-intensive cases increases relative to the frequency of the less resource-intensive cases in subsequent years, we agree that there is a change in case mix. The portion of the change in the case mix that is real (that is, that does not result from coding improvements) represents an increase in resource requirements that should be recognized by increased payments in the subsequent years. However, the actual resource requirements for a set of cases does not change merely because the cases are processed through different GROUPE

versions. Consequently, for the year in which the Grouper refinements are initially effective, the average case weight should be the same when the cases are processed through the old and the new Grouper versions.

In the proposed rule, we based the 1.35 percent reduction in the DRG weights on a comparison of the average FY 1988 case-mix index value with the average case-mix index value for the FY 1988 cases processed through Grouper 3. We used only FY 1988 cases paid under the prospective payment system. Upon further analysis, we have decided to make two changes in our methodology. First, we have used data from all hospitals subject to the prospective payment system and short-term acute care hospitals in the waiver States in order to be consistent with the data set used to recalibrate and

normalize the DRG weights. Second, we have concluded that the method we used in the proposed rule does not give appropriate recognition to changes in the distribution and resource intensity of FY 1987 cases in determining the overall adjustment for case-mix increases occurring between FY 1986 and FY 1988. To take these changes into account, we have determined the case-mix adjustment in this final rule by using two steps. First, we processed FY 1987 MEDPAR data (cases that were paid using Grouper 4) through Grouper 3 and computed a case-mix index value. The difference between the actual FY 1987 case-mix index value and the case-mix index value for the FY 1987 cases using Grouper 3 represents the change in case mix attributable to the Grouper 4 classification changes. We determined there was a .29 percent

increase in the case-mix index between Grouper 3 and Grouper 4 using the FY 1987 cases. Next, we processed FY 1988 data through Grouper 4 and computed an average case-mix index value. The FY 1988 case-mix index value was .93 percent higher than the case-mix index value for the FY 1988 cases processed through Grouper 4. The combined increase was 1.22 percent. Based on this analysis, in this final rule, we have reduced the FY 1990 weights to remove the 1.22 percent increase in the average case weight attributable to Grouper changes and recalibration between FY 1986 and FY 1988. We make this reduction by multiplying the FY 1990 weights after normalization by .9879 (1 divided by 1.0122). The results of our analysis are shown below:

EFFECT OF GROUPEL VERSION ON FY 1988 CASE-MIX INDEX VALUE

	Number of FY discharges	Grouper 3 case-mix index	Grouper 4 case-mix index	Grouper 5 case-mix index	Percent difference between Grouper versions
1987	9,753,095	1.2354	1.2390		.29
1988	9,983,903		1.2691	1.2809	.93
					1.22

If we had made no change in methodology between the proposed rule and the final rule, but merely used updated FY 1988 data, the reduction would have remained at 1.35 percent.

Comment: Several commenters noted that the Grouper changes result in a better classification system and suggested that the case-mix index value and payments that results from Grouper 3 and 4 were inappropriately low because these enhancements were not reflected in those Grouper versions. These commenters suggested that it is inappropriate to assume that the Grouper 5 weights are inflated; instead, it is just as likely that the Grouper 3 weights were deflated.

Response: The relative weights distribute payments across DRGs and should not influence aggregate payment levels. Although the new Grouper contains improvements in the classification system and updated weights, these changes do not affect the actual resource requirements of the cases to be processed with the Grouper and the average case weight should remain the same. If there is a change, it means that implementation of the new Grouper was not budget neutral. Thus, the issue is not whether

the Grouper 5 weights were inflated or the Grouper 3 weights were deflated relative to an appropriate payment level. Rather, the issue is whether the Grouper 5 average case weight is inflated relative to what the average case weight would be if the Grouper revisions were implemented in a budget neutral manner.

Comment: One commenter expressed concern that HCFA attributes increases in the average case-mix index value to coding changes and suggested that no major changes have occurred in coding practices in the last three years. Therefore, it is inappropriate for HCFA to attribute increases in the case mix index value to coding changes without conducting actual reviews of coding to substantiate this claim. Another commenter noted that the upward shift in the measured case-mix index value between the two Grouper versions fails to isolate the effect of coding changes and could as readily be observed even if no DRG classifications were changed as long as the relative costliness of DRGs in the two Grouper versions is not identical. One commenter submitted an analysis concluding that changes in the average case-mix index value could be the result of three factors: real change in patient mix and improvements in the DRG

system; changes in coding result in apparent or nominal changes in case mix; and changes in the relative cost structure of the DRGs. The commenter indicated that real changes in case mix cannot be distinguished from changes in case mix that are the result of coding practices and concluded that, since HCFA cannot demonstrate that the increase in case mix is not real, the reduction in the DRG weights should not be made.

Response: In the proposed rule, we indicated that we were making the reduction in the DRG weights because our analysis indicated that changes made to the Grouper program and recalibration, coupled with changes in hospital reporting practices made in response to those changes, inflated the case-mix index value and, therefore, program expenditures. Unfortunately, our mention of changes in hospital coding practices has confused the underlying problem the reduction in DRG weights is to address; that is, for whatever reason, the changes in Grouper versions and relative weights between FYs 1986 and 1988 artificially inflated the FY 1988 case-mix index value and a reduction is needed in the DRG weights in order not to build the

inflated values into future prospective payment amounts.

As several commenters noted, the reason the case-mix index value for the FY 1988 cases is higher than it would have been if the Grouper changes had not been made is because there was a change in the distribution of cases across DRGs between the cases used to determine the Grouper 4 and Grouper 5 relative weights and the FY 1988 cases. Relatively more cases fell into higher-weighted DRGs in FYs 1987 and 1988 than had been projected when the Grouper 4 and Grouper 5 relative weights were established. To some extent, the change in distribution represents a real change in resource requirements between, for example, the FY 1986 cases used in the Grouper 5 recalibration and the FY 1988 cases paid using Grouper 5.

The remainder of the change in distribution represents only a nominal change in the resource requirements between the two sets of cases. For example, one of the Grouper 5 changes was to eliminate age 70 or over as a factor that would automatically classify a case into the "with CC" (complications or comorbidities) DRG of a paired DRG. We projected the impact of this change in establishing the Grouper 5 relative weights based on the CCs coded on the FY 1986 bills. A case previously assigned to the "with CC" DRG on the basis of age was reclassified to the "without CC" DRG if no CCs were shown on the bill. In FY 1988, a higher percentage of cases in the paired DRGs had CCs shown on their bills than had been projected on the basis of the FY 1986 bills. In part, more CCs were shown because there was a real change in the percentage of patients with CCs; however, more CCs were also shown because coding of CCs had not been required under the prior Grouper versions in order for a patient age 70 or older to be classified in the "with CC" DRG. The latter cases represent only a nominal change in resource requirements since the CCs existed but had not been coded in FY 1986. It was this type of change that prompted the reference in the proposed rule to changes in reporting practices contributing to the inflated case-mix index value.

For purposes of establishing the FY 1990 DRG weights, we do not believe it is necessary to determine how much of the change in distribution of cases was real and how much was nominal. This determination is not relevant to the basic issue of whether implementation of the new Grouper versions and relative weights was budget neutral.

There is no change in the actual resource requirements of the FY 1988 cases when they are processed through Grouper 4 or when the FY 1987 cases are processed through Grouper 3. Any measured differences in the case-mix index must be attributable to the Grouper changes and recalibrations made in those years.

Comment: One commenter maintained that with the refinements in the new Grouper, we should expect some changes in distribution of cases and that the appropriate test for budget neutrality is the changes in the data base on which the Grouper is developed rather than a comparison based on two different Grouper versions. Other commenters argued that our proposal to reduce the DRG weights represents a break with our historical policy of making DRG reclassification and recalibration budget neutral. Some commenters contended that the reduction is solely a budget strategy and not a methodological improvement.

Response: When we make the DRG classification changes and recalibrate the DRG weights to reflect changes in the relative resource intensity across DRGs, we normalize the new DRG weights by an adjustment factor intended to ensure that implementation of the new Grouper version and DRG weights will be budget neutral. With normalization, the average case weight after making the Grouper changes and recalibrating the weights equals the average case weight for the same set of cases before making any changes. We use the most recent data available to estimate the average case weight used in normalization. Nevertheless, there is a 2-year lag between the data used to establish the new DRG weights and the year the new weights are effective. For example, we used FY 1986 data to establish the FY 1988 DRG weights. Since normalization is based on the distribution of cases from 2 years earlier, the resulting factor is an estimate of the adjustment needed to ensure that the Grouper changes and recalibration achieve budget neutrality. There is no assurance that actual expenditures will not be affected by the changes. The appropriate test for determining whether budget neutrality is actually achieved is to compare the average case weight for the actual cases processed during the year the new DRG weights were effective with the average case weight for the same set of cases using the Grouper and DRG weights in effect in the prior year. This comparison determines what the normalization factor would have been had the actual data needed to ensure

budget neutrality had been available at the time the new DRG weights were established. We believe that this refinement is needed to assure, at the very least, that any changes in the case-mix index resulting from Grouper versions are not built into future prospective payment amounts. Therefore, the reduction is entirely consistent with our policy of making Grouper changes and recalibration budget neutral.

Comment: One commenter argued that since HCFA is required by law to recalibrate annually, the argument that FY 1988 payments would have been lower if the Grouper in effect in FY 1986 had still been in place for FY 1988 is irrelevant. The commenter further notes that HCFA could not have continued to use the FY 1986 reclassifications without rescinding the FY 1987 reclassifications and concluded that, at the very least, HCFA should not have compared the case-mix index value for FY 1988 cases using the FY 1986 Grouper, but rather with the case-mix index value obtained with the FY 1987 Grouper.

Response: We do not believe the commenter's assertion is correct. We recognize that we are required to make appropriate DRG classification changes and recalibrate annually and have not suggested otherwise. However, the Grouper changes and changes due to recalibration should be budget neutral. The test for whether the effect of the Grouper revisions is budget neutral is whether the case-mix index value for FY 1988 cases is the same as it would have been in the absence of those revisions.

The reduction in DRG weights is based on the changes in the case-mix index value between FYs 1986 and 1988. We chose this time period because the FY 1986 cases were used to recalibrate the DRG weights in the Grouper 5 program, which, in turn, was used to pay the FY 1988 cases that are being used to establish the FY 1990 DRG weights. In the proposed rule, we compared the actual case-mix index value for the FY 1988 cases with the case-mix index value for these cases processed with the FY 1986 Grouper. The 1.22 percent reduction in the final rule is based on the combined differences in the average case-mix index values between the actual FY 1988 case-mix index value and the case-mix index value for the FY 1988 cases processed with the FY 1987 Grouper and between the actual FY 1987 case-mix index value and the case-mix index value for the FY 1987 cases processed with the FY 1986 Grouper.

Comment: One commenter asked why the FY 1988 claims were not processed

through GROUPE 6 and GROUPE 7 and noted that there were changes made to these GROUPERS that may also have affected the case mix. Since GROUPE 7 will be used to pay the FY 1990 claims, the commenter suggested that normalization should be based on GROUPE 7 rather than the GROUPE that was used to pay the claims in FY 1988.

Response: The commenter appears to be confusing the normalization process with the methodology for arriving at the proposed 1.35 percent reduction (1.22 percent in this final rule). In normalizing the FY 1990 weights, we processed the FY 1988 claims through GROUPE 6 and GROUPE 7. The GROUPE 7 weights after recalibration are adjusted so that the average GROUPE 7 case weight equals the average case weight for the FY 1988 cases processed through GROUPE 6. This average case weight is then reduced to remove the inflated amounts attributable to GROUPE changes and recalibration between FY 1986 and FY 1988.

Comment: One commenter noted a difference between the number of cases used for the case-mix index comparison (9,142,064) and the 9.7 million cases shown in Table 7. The commenter suggested that each of the references to the 1988 MEDPAR data should have been identified with the date of the update and an indication of which data had been excluded.

Response: In the proposed rule, we used FY 1988 MEDPAR data received through December 1988. In establishing the proposed relative weights, we used discharge data from all hospitals subject to the prospective payment system and short-term acute care hospitals in the waiver States. In the case-mix comparison, we included only those hospitals that were subject to the prospective payment system.

To establish the final DRG relative weights set forth in this document, we are using FY 1988 MEDPAR data received through June 1989. The number of cases used for this purpose total 9,983,359, including 81,534 statistical outlier cases and 159 cases in low-volume DRGs that were eliminated for purposes of recalibration. The statistical outlier cases are included in normalization and both statistical outlier cases and low-volume DRG cases are included in Table 7.

The 1.22 percent reduction to the DRG weights is based on analysis of both FY 1987 MEDPAR data received through June 1988 and the FY 1988 MEDPAR data received through June 1989. In this final rule, we have included data from all hospitals subject to the prospective payment system and short-term acute

care hospitals in the waiver States in order to be consistent with the data set used to recalibrate and normalize the DRG weights. There were 9,753,095 cases in FY 1987 and 9,983,903 in FY 1988 data. Slightly more FY 1988 cases (544) were used in this analysis than in recalibration because some claims could not be associated with the hospital-specific data required to standardize the charges on the bill. If we had limited the data set to prospective payment system hospitals only, as we did in the proposed rule, the resulting reduction factor would have been 1.24 percent.

Comment: One commenter questioned whether the validity of our assumption that application of the case-mix index to different GROUPERS using the same data should result in the same average case weight. The commenter suggested several factors that could account for the difference in the case-mix index value among GROUPERS using the same data:

- A difference in the crosswalk codes used to map and to remap the data.
- Errors in remapping the diagnosis and procedure codes.
- Differences in the CCs that would be recognized in the GROUPE versions.
- A different distribution of cases grouping to each DRG across years.

Response: If a new GROUPE version is implemented in a budget-neutral manner, by definition, the average case weight for the cases processed using the new DRG version and weights should be the same as the average case weight for the same cases processed with the earlier GROUPE version and weights.

We believe that the first three factors the commenter has suggested would have an immaterial effect on the average case weight difference between GROUPE versions. For example, a difference in the crosswalk codes to map the FY 1986 codes into their FY 1988 equivalents for purposes of establishing the GROUPE 5 weights and the crosswalk codes to remap the FY 1988 codes into their FY 1987 equivalents for purposes of the analysis is not relevant. The issue was not whether the same crosswalks were used to map and to remap the data but rather whether the remapping was appropriately done. The remapping was based on "A Conversion Table of New ICD-9-CM Codes" by Robert Seaman, published in "Coding Clinic", Second Quarter 1988. This information and an explanation on how 12 surgical codes that remap into more than 1 code were handled in the analysis were provided during the comment period to individuals who requested information on this aspect of our analysis. We

received no public comments claiming that our remapping was incorrect.

The commenter correctly pointed out a problem with the CC Exclusions List (one of the GROUPE 5 changes), under which certain diagnoses included in the standard list of complications and comorbidities are not considered a valid CC in combination with a particular principal diagnosis. As a result, a FY 1988 bill in one of the affected DRGs would not necessarily contain any GROUPE 4 CCs that are not also CCs in GROUPE 5. When this bill is crosswalked back to GROUPE 4, it may not contain any GROUPE 4 CCs and would group to the lower-weighted DRG for the principal diagnosis "without CC." Although this situation could occur, we believe it would happen fairly infrequently and, for several reasons, should not have a significant effect on the results of our analysis. First, this issue relates only to the portion of the analysis concerning the remapping of FY 1988 cases from GROUPE 5 to GROUPE 4 since the CC would still be coded on the FY 1987 cases. Second, the potential situation would be limited to cases falling into one of the 115 DRG pairs. Third, most cases classified "with CC" in GROUPE 4 were because the patient was age 70 or over. This information would still appear on the FY 1988 bill and would still result in the patient being remapped into the "with CC" DRG. Finally, our analysis indicates that the percentage of CC cases within the paired DRGs using FY 1988 cases processed through GROUPE 4 (85.7 percent) is slightly higher than the percentage of CC cases within the paired DRGs using FY 1987 cases processed through GROUPE 4. Thus, it would appear that only an insignificant number of cases might have been dropped as CCs in the remapping.

The change in the relative distribution of cases between GROUPE 3 and GROUPE 5 partially explains the 6.4 percent increase in the case-mix index. However, the reduction in the weights that we proposed is not intended to account for the changes in the relative distribution of cases because it uses the same set of cases, FY 1988, in both GROUPERS.

Comment: Several commenters noted that the reduction in the DRG weights will have a differential impact on those hospitals that have not had any increase in case mix attributable to the GROUPE changes and recalibration. One commenter noted that the causes for the increase are not spread equally across all DRGs or across all hospitals. Another commenter suggested that it

would be more appropriate to make the reduction on a hospital-specific basis based on each hospital's actual experience.

Response: We recognize that the DRG changes and recalibration in GROUPE 4 and GROUPE 5 affected the case-mix index value for some hospitals more than for others. However, the DRG weights reflect the national experience with regard to the relative resource requirements of Medicare cases. Any changes in the DRG weights are based on national average data and must apply across all classes of hospitals. To do otherwise would require establishing separate sets of weights by classes of hospitals. We believe this is neither feasible nor desirable.

Comment: One commenter expressed concern that tables equivalent to Tables 7A and 7B (length of stay tables for GROUPEs 6 and 7) were not published in the proposed rule for GROUPE 3, GROUPE 4, and GROUPE 5. The commenter suggested that these tables were needed to verify the results of HCFA's analysis. The commenter recommended that any reduction in weights be delayed until HCFA publishes these tables and the actual codes and computer procedures used to remap the codes for GROUPE 5 to GROUPE 4 and for GROUPE 4 to GROUPE 3 as well as the original codes used to map from GROUPE 3 to GROUPE 4 and from GROUPE 4 to GROUPE 5. Another commenter stated that the proposed reduction in the DRG weights represented a major departure from previous policy and the commenter indicated that more detailed information should be made available for public review and comment. One commenter believes that documentation that is adequate to evaluate the calculation of the reduction was not made available and suggested that the entire data set be submitted for a qualified, independent audit and statistical analysis.

Response: We do not publish all the material used in preparation of our proposals because of the voluminous amounts of information that would have to be published and because these data would be of limited interest to most readers. However, we agree that relevant data and information should be made available to the public. For this reason, in the proposed rule, we set up a process for expediting data requests (54 FR 19657; May 8, 1989). Thus, information relating to our study was made available during the public comment period. This information continues to be available on request.

With respect to submitting study data for an independent audit and analysis, we do not believe such an action is

necessary because we receive independent analysis through the public comment process.

III. Changes to the Hospital Wage Index

A. Background

Section 1886(d)(2)(C)(ii) of the Act required, as a part of the process of developing separate urban and rural standardized amounts for FY 1984, that we standardize the average cost per case of each hospital for differences in area wage levels. Section 1886(d)(2)(H) of the Act required that the standardized urban and rural amounts be adjusted for area variations in hospital wage levels as part of the methodology for determining prospective payments to hospitals for FY 1984. To fulfill both requirements, we constructed an index that reflects average hospital wages in each urban or rural area as a percentage of the national average hospital wage.

For purposes of determining the prospective payments to hospitals in FY 1984 and 1985, we constructed the wage index using calendar year 1981 hospital wage and employment data obtained from the Bureau of Labor Statistics (BLS) ES 202 Employment, Wages and Contributions file for hospital workers. Beginning with discharges occurring on or after May 1, 1986, we have been using a hospital wage index based on HCFA surveys of hospital wage and salary data as well as data on paid hours in hospitals. The methodology used to compute the first HCFA wage index was set forth in detail in the September 3, 1985 final rule (50 FR 35661).

For discharges occurring on or after May 1, 1986 and before September 30, 1987, the wage index was based on wage data from calendar year 1982. For discharges occurring on or after October 1, 1987 and before September 30, 1988, the wage index was based on an equal blend of calendar year 1982 and 1984 wage data.

In the September 30, 1988 final rule, we continued to use the blended wage index based on 1982 and 1984 data for determining prospective payments to hospitals in FY 1989. However, we did make some changes to the index because of the enactment of section 4005(a) of the Omnibus Reconciliation Act of 1987 (Pub. L. 100-203), which added a new section 1886(d)(8)(B) to the Act, as discussed below in section III.C. of this preamble.

B. Updating the Wage Index Data

For discharges occurring in FY 1990, we proposed to base the wage index solely on 1984 wage data. Previously, we had proposed to base the wage index for

FY 1989 solely on 1984 wage data (in the May 27, 1988 proposed rule (53 FR 19508)). However, as a result of a number of revisions to the 1984 wage data that were made between the May 27, 1988 proposed rule and the September 30, 1988 final rule, the national average hourly wage increased slightly, thereby reducing the wage index values for areas not affected by the changes. Therefore, given our concern about the negative impact on aggregate payments to hospitals, we decided to postpone adoption of a wage index based solely on the 1984 wage data. Our current analysis indicates that moving from a blended wage index to one based solely on 1984 data does not have a significant impact on aggregate prospective payments.

As discussed below in section III.D. of this preamble, we indicated that we are conducting a survey to collect wage data for the FY 1991 update to the wage index.

Comment: Several commenters indicated that, even though it would result in using older data, we should continue to use the blended wage index based on 1982 and 1984 wage data until the wage index based on data from the new wage survey Form 2561 is available for use. Many of these commenters believed that the 1984 wage data contain numerous errors as evidenced by HCFA's continuous actions to make corrections to those data. However, there were several commenters who believed that using the 1984 wage survey data represents an improvement over the current blended wage index.

Response: While it is true that we continue to accept corrections to the 1984 wage survey data, we believe that the 1984 wage data are generally accurate. The 1984 wage survey was completed by 99.5 percent of all hospitals subject to the prospective payment system, while only 92.5 percent of hospitals responded to the 1982 survey. We have resolved each correction that has come to our attention and we have revised the wage index prospectively.

In addition, over 67 percent of the 1984 wage surveys were audited, while the final 1982 data came from the hospital directly and were not audited. We believe that the fact that corrections have been made to the 1984 data should not be construed as an indication that the 1984 data are less valid; we have made corrections to the 1982 wage data as well. We believe that the 1984 wage data represent the latest and most complete and accurate data currently available for constructing the hospital wage index. Given the criticisms we

have received concerning the use of old data, we do not believe it is appropriate to continue to use 1982 wage data in constructing the wage index.

We note that recent corrections have resulted in relatively small changes to the wage index values for most affected Metropolitan Statistical Areas (MSAs) and rural areas. As a matter of fact, several corrections resulted in no change or a change to only the third or fourth decimal place of the wage index value for the affected area.

Comment: Several commenters suggested that the wage index based solely on 1984 data should be adjusted so that implementation of the wage index does not result in any reduction to total aggregate prospective payments (that is, changes to the wage index should be budget neutral). One of these commenters believes that any change made to the prospective payment system should be budget neutral except for provisions that Congress has specifically indicated should result in an increase or decrease in payments. Another commenter cited language in the Conference Committee Report that accompanied Pub. L. 100-203, which states, "The conferees intend that the Secretary implement any update of the wage index in a budget neutral manner." (H.R. Rep. No. 495, 100th Cong., 1st Sess. 526 (1988).)

Response: While it is true that implementation of the new wage index does have the effect of reducing Medicare payments by an estimated 0.1 percent, we are not making a budget neutrality adjustment to the revised wage index for several reasons. First, we consider 0.1 percent to be insignificant in terms of total program payments made to hospitals under the system. In addition, the 0.1 percent reduction results not only from the implementation of a wage index based solely on 1984 data but also from the wage data corrections. If the original wage data had been reported accurately, implementation of the new wage index would have less impact on program outlays.

Finally, since the implementation of the prospective payment system, we have made other changes to the hospital wage index without making a budget neutrality adjustment. Historically, these changes have both decreased and increased the total Medicare prospective payment to hospitals. For example, when we implemented the wage index for FY 1988 (that is, the 1982/1984 blended wage index), we estimated that the total Medicare prospective payments would increase by 0.1 percent, but we made no budget neutrality adjustment.

The conference committee language cited by one commenter accompanied changes made by Congress in section 4004 of Pub. L. 100-203. Section 4004(a) of Pub. L. 100-203 amended section 1886(d)(3)(E) of the Act to require the Secretary to update the hospital wage index no later than October 1, 1990 (and at least every 36 months thereafter) based on a survey of wages and wage-related costs in prospective payment hospitals. We interpret the committee report language as applying to changes to the wage index beginning in FY 1991. We are conducting a new wage survey and intend to implement a new wage index based on this survey in FY 1991 in a budget neutral manner.

Comment: One commenter indicated that in duplicating HCFA's construction of the wage index, several methodological shortcomings were discovered. Although the changes recommended by the commenter would have little impact in terms of aggregate Medicare payments, they could have a significant impact on the affected wage areas. Specifically, the commenter indicated that the data base contains data from hospitals that reported wages and hours over a period of time of less than or greater than 12 months. It was suggested that the short and long reporting periods be eliminated from the data base. Alternatively, the wages and hours reported for these short periods should be weighted to reflect a full 12-month period. The commenter also noted that HCFA has inflated the wages reported to a common date (August 31, 1985) using the year end data of the cost reporting period. The commenter suggested that if HCFA continues to use short and long reporting periods, the inflator used should be determined and calculated based on the midpoint of the reporting period. Finally, the commenter pointed out that the wages reported from hospitals with reporting years ending after August 31, 1985 were not deflated to the date, and some hospitals were identified as having a September 30, 1985 year end but were eliminated even though it represented a 13-month cost reporting period.

Response: We agree that it would be preferable for the wage index methodology to provide for special handling of hospitals with short or long cost reporting periods. However, because of the limited number of hospitals in certain MSAs upon which we can base the wage index values, we cannot, for purposes of determining the wage index values for these MSAs, eliminate these hospitals' data. Therefore, we have not accepted the commenter's recommendation to eliminate these short or long reporting

periods. Furthermore, we agree with the commenter that a short reporting period (that is, 1 to 6 months) may not be representative of hospital's average wage levels. Therefore, we do not believe it would be appropriate to weight the wages and hours in a short reporting period to reflect a full 12-month period. We will, however, continue to analyze this issue in conjunction with the construction of the FY 1991 wage index from the new survey data.

We agree with the commenter's suggestion that the inflation factor should be applied to the hospital's data based on the reporting period's midpoint rather than its year end. This calculation will not affect most hospitals' data as a full year was reported and the inflation factor for these hospitals will be the same. In addition, because of this change, data from hospitals whose first year prospective payment system cost reporting period ended after August 31, 1985, will be deflated to the common point. We have also made corrections to the 1984 data for any reporting period data errors, including first year prospective payment system cost reporting periods ending September 30, 1985.

Comment: A few commenters suggested that a regional wage index be developed to replace the current wage index which is based on MSAs. The commenters believe that this type of wage index would be more accurate and fairer to rural hospitals that are near urban areas and must compete in the same labor markets.

Response: The MSA/NECMA definitions as established by the Office of Management and Budget are widely accepted and are used by many Federal programs to account for and recognize economic and population differences among urban areas. We do not believe that a regional wage index would account for wage differences experienced by areas that are geographically close to one another. We believe that a regional wage index would ignore the sometimes large variations that often exist within regions. We intend to examine the issue of labor market areas in conjunction with the development of the FY 1991 wage index.

C. Revisions to the Wage Index for Rural Counties Whose Hospitals Are Deemed Urban

Under section 1886(d)(8)(B) of the Act, for discharges occurring on or after October 1, 1988, hospitals in certain rural counties adjacent to one or more Metropolitan Statistical Areas (MSAs)

are considered to be located in one of the adjacent MSAs if certain standards are met. Because of this provision, as a part of the September 30, 1988 final rule, we reclassified the wage data for those rural areas as if the hospitals in those areas were located in the adjacent MSAs and recomputed the wage index values for the affected MSAs and rural areas.

Because inclusion of the wage data from rural hospitals that are considered to be located in an adjacent MSA under section 1886(d)(8)(B) of the Act resulted in the reduction of the wage index values of several MSAs and rural areas, Congress enacted section 8403(a) of Pub. L. 100-647. Under that provision, which added a new section 1886(d)(8)(C) to the Act, if the inclusion of wage data from rural hospitals now considered to be located in an urban area results in a reduction of the wage value for the affected MSA or rural area, then the wage index values for those affected areas must be recomputed as if section 1886(d)(8)(B) of the Act had not been enacted. The wage index value for those rural counties with hospitals that were deemed urban and that are affected by this recomputation must be calculated separately. This provision is effective for discharges occurring on or after October 1, 1989 and before October 1, 1991.

Therefore, we proposed to calculate the wage index for FY 1990 in the following manner with respect to the geographic classification of hospitals:

- MSAs whose wage index values are reduced because of the inclusion of wage data from hospitals in adjacent rural counties that have been deemed to be located in the MSAs would have their wage index values recalculated as if section 1886(d)(8)(B) of the Act had never been enacted; that is, data from the rural hospitals would be excluded in calculating these MSAs' wage index values.

- Each county whose hospitals have been deemed to be located in such an MSA would have its own unique wage index value, that is, a wage index value calculated on a county-specific basis.

- Rural areas whose wage index values are reduced by the exclusion of wage data from hospitals that have been deemed to be located in adjacent MSAs would have their wage index recalculated as if those hospitals were not deemed to be urban. In this case, the wage data for hospitals located in the rural counties that have been deemed urban would be included in two wage areas, that is, both the affected rural area and the county-specific wage area for the deemed hospitals. Those rural areas whose wage index values are

increased by the exclusion of the wage data for those hospitals that have been deemed urban would retain the increased wage index value.

Using 1984 data, the proposed wage index value for every MSA in which rural hospitals have been deemed to be located was lower than it would have been if those hospitals had not been included. Therefore, the proposed wage index value for the MSA was computed without including data from the deemed rural hospitals and the proposed wage index value was computed on a county-specific basis for every rural county whose hospitals have been deemed to be urban. As proposed, there were seven rural areas that had their wage index value recalculated to include the hospitals that have been deemed urban. Since we have traditionally designated the urban and rural wage index as Tables 4a and 4b, as set forth in the addendum to this document, in the proposed rule, we designated this new county-specific set of wage index values as Table 4c.

Comment: We received a large number of comments suggesting that our proposal to implement section 1886(d)(8)(C) of the Act does not reflect the intent of Congress. Specifically, the commenters pointed out that in many counties whose hospitals were redesignated as urban under the provisions of section 1886(d)(8)(B) of the Act, our proposal to implement a county-specific wage index resulted in those hospitals receiving total prospective payments significantly lower than what they had received following implementation of section 1886(d)(8)(B) of the Act in FY 1989 because those hospitals would be subject to a lower wage index value. Many hospitals would have a wage index value lower than the Statewide rural wage index value. Commenters also noted that because of the low county-specific wage index value, in some cases, hospitals redesignated as urban would receive lower payments than when previously designated as rural. The commenters believe that Congress did not intend to reduce the wage index value applicable to these hospitals below what they had received when they were designated as rural hospitals.

The commenters offered several alternative approaches to rectify this situation. Some commenters suggested that the wage index value for hospitals in those counties redesignated as urban should not be allowed to fall below the Statewide rural wage index value. Alternatively, commenters suggested that the wage index value for these counties be calculated as the highest of

the wage index value for the MSA to which they are deemed to belong, the county-specific wage index value, or the Statewide rural wage index value. Finally, other commenters suggested that we calculate the wage index value of the counties whose hospitals were deemed urban according to the provisions of section 1886(d)(8)(B) of the Act as added by section 4005(a) of Pub. L. 100-203, but calculate the wage index values for the MSA and rural areas affected according to the provisions of section 1886(d)(8) of the Act as amended by section 8403(a) of Pub. L. 100-647. In this way, the hospitals deemed to be urban retain the benefit of a higher wage index value without affecting the values of the affected MSAs and rural areas. One commenter believes that we could use our general "exceptions and adjustments" authority in section 1886(d)(5)(C)(iii) of the Act to make any adjustment for the affected counties.

Response: Section 1886(d)(8)(C) of the Act is very specific as to how wage areas must be treated and does not give us discretion with regard to redesignated counties whose hospital wage index values are lower than the Statewide rural wage index value that would have applied to them absent this new provision. Given the specificity of the law, we believe this provision should be implemented as legislated by Congress.

With respect to Congressional intent, we find no evidence that Congress specifically intended to exempt from a county-specific wage index those redesignated counties whose hospitals have wage index values that are lower than the Statewide rural wage index value. The conference report notes only that the Secretary is expected to develop alternatives to minimize the impact of section 1886(d)(8)(C) of the Act on those hospitals, to be included in a report to Congress required under section 8403(b) of Pub. L. 100-647. (H.R. Rep. No. 1104, 100th Cong., 2d Sess. 276 (1989).) If Congress had intended to exclude those counties from a county-specific wage index, we believe that the legislation would have been drafted accordingly.

With respect to the suggestion that the Secretary use the exceptions and adjustment authority as provided by section 1886(d)(5)(C)(iii) of the Act, we do not agree that it would be appropriate at this time to use this authority. Although we recognize that hospitals in certain counties will be disadvantaged by this provision during FY 1990 to the extent that they will receive a lower wage index value than if they had continued to be paid as rural

hospitals subject to the Statewide rural wage index value, these same hospitals received the greatest increases in payments during FY 1989 when they were paid on the basis of the wage index of the MSA to which they were deemed under the provisions of section 1886(d)(8)(B) of the Act. It is clear that Congress was aware of the impact this provision would have on redesignated hospitals. As noted above, if Congress had intended a different application of this provision, we believe that the law would have provided for it. Therefore, we do not believe it would be appropriate to use our exceptions authority and that section 1886(d)(8)(C) of the Act should be implemented as written.

Comment: Several hospitals that are located in rural counties and are now deemed urban and, therefore, have their own county-specific wage index values, suggested that the new county-specific wage index values are lower than the Statewide rural area values because the wage data for their hospitals are incorrect.

Response: Any hospital that believes that there is an error in its 1984 wage data may request that we make a correction. However, before a correction is made, the hospital must provide adequate documentation supporting a data correction to its fiscal intermediary. After verifying the documentation, the intermediary will submit the request along with a recommendation to HCFA's central office. If the correction is appropriate, HCFA will notify the regional office of the revised wage index value to be implemented effective for discharges occurring on or after the date the regional office is notified of the change. In accordance with our longstanding policy, changes to the wage index are implemented on a prospective basis only. (See our discussion on this issue in the September 30, 1988 final rule (53 FR 38496).)

D. Future Updates to the Hospital Wage Index

Section 1886(d)(3)(E) of the Act (as amended by section 4004(a) of Pub. L. 100-203) requires that wage indexes that are applied to the labor-related portion of the national average standardized amounts of the prospective payment system be updated not later than October 1, 1990 and at least every 36 months thereafter. This section further provides that the Secretary base the update on a survey of the wages and wage-related costs of hospitals in the United States that participate in the prospective payment system. The survey must measure, to the extent feasible, the

earnings and paid hours of employment by occupational category and must exclude data with respect to the wages and wage-related costs incurred in furnishing skilled nursing facility services.

To accomplish this task, we developed two wage index survey forms. The first form (Form A) requested data similar to past surveys, with a few noted exceptions. In addition to the total wages and hours collected in past surveys, Form A also asked for data relative to the salary and hours associated with direct patient-care contracted labor, home office, and fringe benefits. Form A excluded salary and hours associated with the skilled nursing facilities and other related cost centers. The second form (Form B), in addition to the data requested on Form A, requested data relative to several occupational categories.

Before initiating the new hospital wage survey, the proposed forms (A & B) were submitted for prior consultation to various hospital industry representatives, including the major hospital associations, as well as to the fiscal intermediaries. We solicited comments on both forms, including the feasibility of obtaining accurate data. The comments we received suggested that most hospitals would be unable to accurately provide data by occupational categories at this time. As a result of the comments on these two forms, we have modified Form A, now referred to as HCFA-2561.

The HCFA-2561 is currently being used to collect data for the FY 1991 update to the wage index as required by section 1886(d)(3)(E) of the Act. However, before implementing this updated wage index or reaching decisions in the future on the collection of data by occupational categories and incorporating future wage survey forms into the hospital cost report, we are interested in receiving input from the public. Therefore, in the proposed rule, we solicited comments on the following issues:

- Should the wage index include data on contracted labor? For purposes of the wage index survey, contracted labor has been defined as direct patient-care contract labor such as registry nurses. Should the definition be expanded to include contracted services indirectly related to patient-care, such as billing or housekeeping services?

- What portion, if any, of home-office salaries and hours should be added to the wages and hours incurred solely by the hospital?

- Which fringe benefits, if any, should be included in computing the wage index? How should they be valued?

- Would hospitals be capable of providing and identifying verifiable salaries and hours by occupational categories? What occupational groupings would be appropriate?

- If occupational data were collected, what formula or methodology should be used in calculating an occupational-mix index? How would the methodology reflect the varying personnel and hiring decisions made by hospitals, that is, one hospital may hire registered nurses for patient-care whereas another hospital in the same geographic area may employ licensed practical nurses instead?

- Should the HCFA-2561 be incorporated into the hospital report in order to obtain wage data on a regular basis? What level of hospital-specific wage data should be available to the public, including other hospitals? Can the occupational category data be retrieved by adding new schedules to the hospital cost report?

In order to give the public ample time to thoroughly evaluate the six issues listed above, we stated in the proposed rule that we will accept comments on these issues up to September 30, 1989. Comments on these six issues should be submitted to the following address:

Health Care Financing
Administration, Office of
Reimbursement Policy, Division of
Hospital Payment Policy, Attn: Wage
Index Issues, 1-11-1 East Low Rise, 6325
Security Boulevard, Baltimore,
Maryland 21207.

Because of the extended time for public comment, we have not responded in this final rule to any comments received in response to the proposed rule concerning future updates to the wage index. We plan to respond to these comments in the proposed rule concerning the FY 1991 changes to the prospective payment system.

IV. Other Decisions and Changes to the Regulations

A. Annual Publication of Prospective Payment Rates (Section 412.8)

The September 1, 1983 final rule (47 FR 39819) added a provision to the regulations stating that when prospective payment rates are not published by September 1 before the beginning of the Federal fiscal year in which the rates would apply, the rates in effect on September 1 of the year in question will apply unchanged for the following Federal fiscal year. This provision in § 412.8(b)(4) has been superseded by changes to the statute.

Specifically, section 1886(b)(3)(B) of the Act, as amended by section 9109(b) of the Consolidated Omnibus Budget Reconciliation Act of 1985 (Pub. L. 99-272) and section 4002 of Pub. L. 100-203, specifies the update factors for prospective payment hospitals beginning in FY 1986 and each year thereafter. Because the law sets the rates for each Federal fiscal year, which are effective October 1 of each year, the provisions of § 412.8(b)(4) no longer conform to the law. Therefore, we proposed to delete this section.

Comment: We received a few comments regarding our proposal to delete the provision of § 412.8(b)(4) from the regulations. It was suggested that these regulations not be deleted but rather revised to state that in the event that revised prospective payment rates are not published by September 1, then the rates in the succeeding fiscal year will be the rates as of September 1, increased by the most recent hospital market basket forecast.

Response: We believe that it is unnecessary to include such a provision in the regulation. Section 1886(b)(3)(B) of the Act, as amended by section 9109(b) of Pub. L. 99-272 and section 4002 of Pub. L. 100-203, specifies the update factors for prospective payment hospitals, which for FY 1990 and each subsequent year is equal to the market basket percentage increase. Section 1886(b)(3)(B)(iii) of the Act defines the market basket percentage increase as the percentage, as estimated by the Secretary before the beginning of the applicable fiscal year, by which the cost of the mix of goods and services comprising routine, ancillary, and special care unit inpatient hospital services will exceed the cost of these goods and services for the preceding fiscal year.

We believe that we are required by the law to use the most recent hospital market basket forecast in making this estimate. In the absence of a published rate, the prospective payment rates will increase as of the succeeding fiscal year by an amount equal to the most recent forecasted increase in the hospital market basket, as prescribed by law.

In addition, since the update factors for prospective payment hospitals are set by law, the legislatively mandated factors would automatically be applied to the rates regardless of whether a notice was published timely. Given the fact that the update factors are subject to change annually based on recommendations submitted to Congress by the Department and ProPAC (sections 1886(e)(4) and 1886(e)(3)(A) of the Act, respectively), the market basket increase may not be the update factor

prescribed by Congress for any given fiscal year. Therefore, since the law would take precedence over any regulations we may publish, we do not believe it is necessary to stipulate the update factor that would be applied to the rates if a notice of new rates is not published timely.

B. Burn Outliers (Section 412.84)

Section 4008(d)(1)(A) of Pub. L. 100-203 changed the marginal cost factor to 90 percent for day and cost outliers in DRGs related to burn cases. This provision was effective for discharges occurring on or after April 1, 1988 and expires as of October 1, 1989. We proposed to retain the marginal cost factor for cost outliers at 90 percent; however, we proposed to reduce the marginal cost factor for day outlier cases to 60 percent effective for discharges occurring on or after October 1, 1989 (that is, the same marginal cost factor as other DRGs). Therefore, we proposed to amend § 412.84 accordingly.

In the September 30, 1988 final rule (53 FR 38505), we indicated that ProPAC had issued a report that addressed outlier payments for burn cases and that we would review ProPAC's findings and recommendations to determine if changes in the burn outlier policy may be appropriate for FY 1990.

ProPAC's report indicated that increased outlier payments may only be appropriate for those cases treated in specialized burn centers and units. However, recognizing that no clear criteria currently exist to classify such centers, ProPAC postponed making specific recommendations pending further evaluation. While we recognize ProPAC's concern that outlier cases result in a more serious impact on specialized burn centers and units than to general hospitals treating burn cases, we generally do not believe it appropriate to create a new class of hospital (that is, burn hospitals and burn units) simply for purposes of targeting outlier payments.

As an interim measure, ProPAC recommended that burn cases be paid cost outliers only, based on a 90 percent marginal cost factor. In addition, ProPAC believes that the outlier payment pool for burn cases should be maintained at 19 percent of total payment for burn cases. This 19 percent figure represents the impact on burn outlier payments of increasing the marginal cost factor from 60 percent to 90 percent. ProPAC also recommended separate outlier thresholds for burn cases be established in order to maintain the 19 percent outlier payment pool.

While ProPAC's recommendation may target more burn outlier payments to specialized burn treatment centers, there is currently no statutory authority to eliminate day outlier payments. However, we agree that the 90 percent marginal cost factor may not be appropriate for less severe burn cases. Therefore, we believe it would be appropriate to reduce the marginal cost factor from 90 percent to 60 percent for day only outliers associated with burn cases since these generally represent less resource-intensive cases. Thus, as proposed, exceptionally costly day outliers, that is, those that meet both the day and cost outlier thresholds, would be paid the greater of 60 percent of the per diem Federal rate for each day beyond the length of stay threshold or 90 percent of the difference between adjusted charges and the cost thresholds.

Comment: Several commenters were concerned about our proposal to reduce the marginal cost factor for burn day outlier cases from 90 to 60 percent. One commenter stated that the reduction should be accomplished gradually over several years to give the affected hospitals time to adjust to the payment changes. Another commenter believes that lowering the marginal cost factor for day outliers to the same factor as all other day outliers reintroduces financial risk for hospitals that treat these cases and promotes the delivery of services in more costly settings. Also, this commenter states that the fact that HCFA is changing the policy so soon after its implementation (that is, April 1, 1988) violates the fundamental principle of the prospective payment system that the system is designed to assure hospital managers of predictability of rates and regulations.

Response: Our data show that specialized burn units generally receive more costly burn outlier cases that tend to be more resource intensive. General hospitals, on the other hand, mainly treat the less severe burn cases that may qualify as day outliers. We believe our proposed policy most closely achieves the policy goals of targeting outlier payments for the most costly burn cases, while at the same time maintaining outlier payments at approximately the same percentage of total payments for burn cases. We note that ProPAC supports this policy as an improvement over current law since it reduces the financial risk associated with treating burn cases at specialized centers.

With regard to the comment on violation of the principles of the prospective payment system, we note that the marginal cost factor for burn

outliers was revised to 90 percent as of April 1, 1988 because we were required to do so by the provisions of section 4008(d)(1)(A) of Pub. L. 100-203. This provision expires as of October 1, 1989. Thus, we believe that a change in outlier policy for burn cases should have been anticipated by hospitals treating these cases. We are retaining the 90 percent factor for cost outliers. However, absent this policy, the marginal cost factor for both day and cost burn outliers would have reverted to the factor used for all other outliers, that is, 60 and 75 percent, respectively.

C. Payments to Sole Community Hospitals (Section 412-92)

Section 1886(d)(5)(C)(ii) of the Act provides special payment protections under the prospective payment system to sole community hospitals (SCHs). The statute defines an SCH as a hospital that, by reason of factors such as isolated location, weather conditions, travel conditions, or absence of other hospitals (as determined by the Secretary), is the sole source of inpatient hospital services reasonably available to Medicare beneficiaries. The regulations that set forth the criteria that a hospital must meet to be classified as an SCH are at § 412.92(a). To be classified as an SCH, a hospital must either have been designated as an SCH prior to the beginning of the prospective payment system or meet one of the following requirements:

- It must be located more than 50 miles from other like hospitals.
- It must be located between 25 and 50 miles from other hospitals, and it must—
 - Serve at least 75 percent of inpatients in its service area;
 - Be isolated by local topography or extreme weather conditions for one month of each year; or
 - Have fewer than 50 beds and would qualify on the basis of market share except that some patients seek specialized care unavailable at the hospital.

• It must be located between 15 and 25 miles from other hospitals and isolated by local topography or extreme weather for one month of each year.

SCHs are paid a blended rate based on 75 percent of the hospital-specific rate and 25 percent of the Federal regional rate. An SCH is eligible for a payment adjustment if, for reasons beyond its control, it experiences a decline in volume of greater than five percent compared to its preceding cost reporting period. (This adjustment is also available to a hospital that could qualify as an SCH but chooses not to be paid as an SCH.) In addition, an SCH is

eligible for an adjustment to its hospital-specific rate if it adds new services or facilities. SCHs are also exempt from the percentage reductions in reasonable cost payments for capital-related costs, as provided in section 1886(g)(3) of the Act.

In the September 30, 1988 final rule (53 FR 38513), we noted, in response to several ProPAC recommendations concerning SCHs, that our analysis of the SCH provisions is an on-going process. We also noted that we would continue to study whether our criteria are appropriate for determining which hospitals are the sole source of care for Medicare beneficiaries and whether sufficient protections are in place to assure beneficiary access to inpatient hospital services in rural areas.

Our analysis indicates that some SCHs would receive higher Medicare payments if they were to forego SCH status and be paid at the national rate. We believe these SCHs may be reluctant to give up their status because they may have difficulty requalifying if circumstances change to make SCH status more favorable in the future.

With this concern in mind, we proposed a revision to § 412.92(b)(4)(iii). That section currently states that if a hospital cancels its classification as an SCH, it may not apply for reclassification as an SCH unless all hospitals within 50 miles of it have closed. Because we believe this provision is restrictive and may prevent some existing SCHs from relinquishing their status even though it might be financially advantageous for them to do so, we proposed elimination of the hospital-closure-within-50-miles provision in § 412.92(b)(4)(iii). Instead, we proposed that, if a hospital cancels its status as an SCH, it may requalify for classification as an SCH only after 1 full year has passed since the cancellation was effective and only if the hospital meets the criteria for qualification that are in effect at the time it reapplies.

Section 1886(d)(5)(C)(ii) of the Act provides for reasonable compensation for significant increases in operating costs resulting from the addition of new services or facilities. Although a similar provision was originally proposed by regulation, Congress explicitly provided for the payment adjustment for new inpatient facilities or services in section 911(a) of Pub. L. 99-272, which amended section 1886(d)(5)(C)(ii) of the Act. The payment adjustment was established effective with cost reporting periods beginning on or after October 1, 1983 and before October 1, 1989 as a temporary measure until a permanent payment methodology could be developed to recognize significant

distortions in operating costs resulting from the addition of new services or facilities. The regulations implementing the payment adjustment are at § 412.92(g).

To date, there has been no legislative change to establish a different payment methodology to provide reasonable compensation for significant cost increases resulting from the addition of new services or facilities. In view of the expiration of the statutory provision explicitly providing for this payment adjustment, we proposed to extend indefinitely by regulation the provisions at § 412.92(g) in order not to disadvantage any SCH that experiences a significant increase in operating costs resulting from new inpatient services or facilities.

Currently, if a hospital wishes to receive a payment adjustment because it experienced a significant volume decrease, it must submit a request for the adjustment to its intermediary along with documentation demonstrating the size of the decrease in discharges and explaining the circumstances giving rise to the decline in discharges and how they were beyond the hospital's control. The hospital must also furnish evidence of the actions it took to control costs in the face of the circumstances cited and the resulting decline in discharges. The intermediary reviews and analyzes the documentation and then forwards the documentation along with its analysis and recommendation on approval to HCFA. HCFA determines the volume adjustment within 180 days from the date it receives the hospital's request and all other necessary information from the intermediary.

In an effort to streamline and expedite this process, we proposed that this determination process be decentralized and handled entirely by the intermediaries. We believe that there is now sufficient experience reviewing hospitals' applications for volume adjustments for intermediaries to make these determinations. We also proposed to revise § 412.92(e)(3) to make this change. We proposed that the intermediaries use the same criteria for review that are currently in place in § 412.92(e). For further discussion of this process, see the September 1, 1983 final rule (48 FR 39786), the June 10, 1987 proposed rule (52 FR 22090), and the September 30, 1987 final rule (53 FR 38510).

We are preparing manual instructions for the intermediaries concerning the determinations of volume adjustments. We proposed that any requests for a volume adjustment that intermediaries have not submitted to HCFA by

September 30, 1989 be processed for a final determination by the intermediaries.

With the deterioration in the financial condition of many rural hospitals, our ability to define appropriately those hospitals that represent the sole source of care reasonably available to Medicare beneficiaries has become increasingly important. In this regard, our criteria for SCH designation have remained largely unchanged since the beginning of the prospective payment system. The regulations reflect an assumption that any hospital located more than 50 miles from the nearest like hospital is the sole source of care reasonably available; conversely, it is assumed that a hospital located within 25 miles of a like hospital would not be the sole source of care reasonably available unless weather conditions make other hospitals inaccessible at least one month per year.

For hospitals located between 25 and 50 miles of another hospital, a market test or a measure of extremes in topography or weather conditions is used to determine whether the hospital qualifies for SCH designation. As clarified in the September 30, 1988 final rule (53 FR 38510), a hospital located between 25 and 50 miles of a like hospital may qualify as an SCH if, during the cost reporting period ending before it applies for SCH status, it admitted at least 75 percent of all the hospitalized residents or 75 percent of all the Medicare beneficiaries who were admitted to any like hospital located within the larger of the requesting hospital's service area or a 50 mile radius. A hospital's service area is the area from which a hospital draws at least 75 percent of its inpatients or a service area defined by a health systems agency. Thus, while a hospital located between 25 and 50 miles of the nearest like hospital cannot be presumed to be or not to be an SCH, it can demonstrate by the size of its market share that it serves as the sole source of inpatient services reasonably available. Also, if a hospital located between 25 and 50 miles of the nearest like hospital has fewer than 50 beds, it can be deemed to meet the market share criterion if its intermediary certifies that the hospital would have met this criterion were it not for the fact that some Medicare beneficiaries or residents of the hospital's service area were forced to seek care outside the service area due to the unavailability of certain specialty services at the hospital with fewer than 50 beds.

An analysis performed by Systemetrics under contract to ProPAC

found that there is an interrelationship between the definition of market area and market share. Generally speaking, the more broadly a hospital's market area is defined, the lower the hospital's market share percentage will be. Further, the greater the distance to the nearest neighbor hospital, the more broadly the market area is defined. One result of the relationship between market share and distance to the nearest hospital is that only a small percentage of the hospitals located more than 50 miles from another hospital would meet the market test. Moreover, the proportion of facilities meeting the 75 percent market test is smaller for those 35 to 39 miles from their nearest neighbor than for those isolated by 25 to 34 miles.

We have concluded from our analysis of the Systemetrics data that the current market share test is inappropriate for hospitals that are located more than 35 miles from a like hospital. The market area for these hospitals, as currently defined, is sufficiently broad to make the 75 percent market share standard unreasonable. The Systemetrics data show only nine percent of hospitals between 35 and 49 miles from another hospital had a market share greater than 75 percent even though the estimated travel time between two hospitals located 35 miles apart would be 45 minutes on the average.

We considered modifying the SCH criteria for hospitals located 35 to 50 miles from a like hospital by narrowing the definition of market area or relaxing the 75 percent market share standard for these hospitals, or implementing both of these changes. We rejected this approach for several reasons. First, we believe that the SCH criteria are already too complicated and that increasing the complexity by adding unique criteria for hospitals located between 35 to 50 miles would be undesirable. Second, given the worsening financial condition of many rural hospitals, we do not believe it would be appropriate to delay changing the criteria until the analyses that would be needed to develop appropriate modifications in the market share test are completed. Finally, considering that the average travel time between two hospitals 35 miles apart is 45 minutes, we believe it is reasonable to assume that a hospital more than 35 miles from a like hospital is the sole source of care reasonably available to Medicare beneficiaries. Therefore, effective October 1, 1989, we proposed to modify our SCH criteria as set forth at § 412.92(a)(1) and (2) to eliminate the market share test for hospitals located more than 35 miles from a like hospital.

We also invited comment on how the SCH criteria might be improved or simplified. In this regard, we stated that we are continuing to analyze whether modifications should be made in the market share test for hospitals located between 25 to 35 miles from a like hospital.

We believe the Systemetrics data confirm the appropriateness of our standard that a hospital located within 25 miles of a like hospital would not be the sole source of care reasonably available unless topography or weather conditions make other hospitals inaccessible at least 1 month per year. The data show that only one percent of hospitals within 25 miles of another hospital provide at least 75 percent of the inpatient services received by Medicare beneficiaries residing within their service area. However, concern has been expressed regarding our criteria in § 412.92(a)(2) and (3), which define isolation of hospitals due to local topography or periods of prolonged severe weather. Under current policy, we require that a hospital must document its inaccessibility for 30 consecutive days in each of the past 3 years in order to qualify as an SCH on this basis (see 48 FR 39781, September 1, 1983). The documentation must be substantiated by an outside source, for example, the State Highway Department or a local public safety official.

In the proposed rule, we stated that we are also considering modifying this policy to require the hospital to document its inaccessibility for 30 nonconsecutive days in 2 out of the last 3 years. We also solicited comments regarding whether this standard would be appropriate.

Comment: Many commenters wrote concerning our suggested changes in the SCH qualifying criteria. All approved of our proposal to eliminate the market share test for hospitals more than 35 miles from the nearest hospital. However, many commenters offered various alternatives to our criteria as follows: One commenter suggested that we abolish the current criteria and reinstate the guidelines that were in effect prior to the implementation of the prospective payment system. Another commenter suggested that we abolish distance as a measure and rely solely on whether a hospital meets the 75 percent market share standard. One commenter believes that SCH status should be granted to a hospital if it provides services that are not available from any other hospital within a 35-mile radius while another believes that we should consider travel time instead of mileage in determining SCH status.

Response: While we appreciate all of the commenters suggestions, we do not believe we can implement any of them at this time. For reasons discussed in detail in the January 3, 1984, final rule (48 FR 271), we replaced the discretionary SCH criteria we used prior to the implementation of the prospective payment system with more objective numerical standards. The current standards incorporate the principles of the criteria that were in effect prior to the implementation of the prospective payment system while at the same time ensuring consistency in classifying hospitals as SCHs. Moreover, the market share test is an operational measure of the variables that influence patients in their decision to seek care at a particular hospital. That is, a hospital's market share will increase if travel or weather conditions curtail access to another hospital, or if physicians admit patients primarily to that particular hospital. If patients commonly use other hospitals for services, we conclude that those alternative hospitals are accessible to them, and that they are not limited to obtaining care at only one hospital.

We chose not to use physician admitting practices as a separate variable because they are included within market share. Physician admitting practices are a major determinant of market share, so using market share as a criteria does include consideration of physician admitting practices. Also, we chose not to use availability of public transportation as a separate criteria because it is included within the market share criteria, and because public mass transit systems are not a common method of transportation for patients receiving inpatient services.

In response to other commenters, we do not believe we should limit our review of SCH qualifications solely to travel time or to the provision of specialty services not available from any other hospital within a 35-mile radius. As we have noted previously, travel time as a measure is subject to many variables such as traffic congestion, road conditions, and time of day. For instance, what might be a 15-minute trip under ideal conditions could be a substantially longer trip on wet or snowy roads or in heavy traffic. Specific travel conditions would have to be defined and each hospital's application reviewed against these specific conditions in order to achieve consistency and equity in the decision process. Since such specific conditions would be extremely difficult to define and more difficult to measure

objectively, we do not believe travel time is as valid a measure as road miles.

Neither do we believe that provision of specialty services not offered by any other hospital within 35 miles should be the sole measure of an SCH. Not only would "specialty" services have to be specifically defined, but measures of the need for and use of such services would have to be established. Furthermore, we do not believe the SCH provision was enacted to protect hospitals providing unique specialty services. Rather, we believe its intent was to ensure Medicare beneficiary access to care ordinarily found in general community hospitals.

With regard to the commenter who suggested that we drop mileage as a criterion and consider only whether the hospital treats at least 75 percent of the patients admitted to a hospital within its service area, we do not believe this suggestion is equitable. As we noted in the proposed rule (54 FR 19650), the data gathered by Systemetrics in its study of rural hospitals and SCH criteria show that the more isolated a hospital is, the greater the chance that it does not meet the 75 percent market share test. Thus, a large number of truly isolated hospitals could not qualify for SCH status. In addition, only 3.3 percent of all rural hospitals meet the 75 percent market share test (before adjustment for specialized care obtained outside the service area of rural hospitals with fewer than 50 beds). Thus, this commenter's suggestion could result in only 89 hospitals nationwide meeting the proposed standard. We do not believe that such a restrictive standard would protect Medicare beneficiaries' access to care or would be in the best interest of the rural hospitals.

Finally, although we are not implementing any of the commenters' suggestions at this time, we will keep them all in mind as we continue to review the SCH qualifying criteria in conjunction with the comments we received on beneficiary access to care in rural areas.

Comment: One commenter suggested numerous revisions to our qualifying criteria ranging from redefining the service area as the smaller of a 35-mile radius from the hospital or the area from which a hospital draws at least 50 percent of its patients. The commenter proposed that we lower the market share test from 75 percent to 60 percent and that we lower from 35 miles to 25 miles the distance from another hospital as the presumptive proof of SCH status. The stated goal of all of these revisions was not only to assure reasonable access for Medicare beneficiaries, but

also to improve financial benefits to rural hospitals.

Response: We do not agree with the premise for the commenter's suggestions. All of them would liberalize the SCH provisions beyond what we believe was Congressional intent in establishing this provision. For instance, granting SCH status to any hospital more than 25 miles from any other hospital would mean that a beneficiary located between the two hospitals would be no more than 12.5 miles from a hospital; we do not believe such a short distance reflects an accessibility problem.

Redefining the service area as the commenter suggested would result in a significant increase in the number of rural hospitals qualifying as SCHs and would include some hospitals that we believe do not represent the sole source of care reasonably available to Medicare beneficiaries. If a significant portion of the residents in a hospital's service area seek care from other hospitals, this indicates that alternative sources of inpatient care are reasonably available.

Although we are not accepting any of the commenter's specific suggestions at this time, we have concluded that the geographic area considered in the market share test is too broad. Under current policy, a hospital may qualify as an SCH if it admitted at least 75 percent of all the hospitalized residents or 75 percent of all the Medicare beneficiaries who were admitted to any like hospitals located within the larger of the requesting hospital's service area or a 50-mile radius. Consistent with our decision to eliminate the market share test for hospitals located more than 35 miles from a like hospital, we are narrowing the geographic area to take into account admissions to like hospitals located within the larger of the requesting hospital's service area or a 35-mile radius. To implement this policy, we are revising § 412.92(a)(2)(i) and (b)(1)(ii)(B). Moreover, we will continue to analyze whether modification in the SCH definitions are needed to ensure reasonable access to care. However, to the extent that rural hospitals require financial assistance and protection from closure, we believe these objectives should be accomplished in alternative ways—not by so liberalizing the SCH criteria that a large percentage of the rural hospitals would qualify as SCHs. We acknowledged that we stated in the proposed rule (54 FR 19651) that the improvements we proposed in the SCH qualifying criteria were made in recognition of the difficulties facing rural hospitals; however, we believe there is a

limit to the extent to which these difficulties should be resolved through the SCH provisions and even through the Medicare program.

We again acknowledge that we are keenly aware of the problems facing isolated rural hospitals and the potential consequences for Medicare beneficiaries should large numbers of these hospitals close. However, as we noted in the proposed rule as a part of our discussion on beneficiary access to care in rural areas (54 FR 19651), "A policy involving changes to the Medicare program alone would not be sufficient to assure essential access to rural health care. A viable and effective rural health care policy must involve Federal, State and local governments, and private insurers." As discussed below in section IV. D. of this preamble, we are continuing to receive comments solicited on this subject and will give all reasonable suggestions serious consideration.

Comment: Only two commenters responded to our proposal to liberalize the provision regarding road closing due to inaccessibility. Both favored our proposal, but believe it did not go far enough. That is, one commenter believes that the determination of accessibility should be arrived at by agreement between the State Highway Department and the hospital. The other commenter believes that while a highway department may consider a road passable, it might be highly inadvisable for a Medicare beneficiary to be driving on such roads.

Response: We are disappointed that our request for comment from interested parties did not generate greater response, and we appreciate the commenters who did address this issue. Neither, however, offered specific suggestions that can be implemented on a nationwide basis. We believe a determination of inaccessibility must be made by a disinterested party such as a State Highway Department and not by the affected hospital. This would be the only way to ensure consistency and impartiality.

Similarly, we agree that while it may be more difficult for aged Medicare beneficiaries to negotiate slippery roads, we do not know how this distinction can be made objectively. Differences in age and driving experience and skill are determining factors usually employed in deciding whether to attempt travel under difficult conditions. We know of no objective standards that can be implemented to measure such factors on an equitable basis. Therefore, we are not adopting the commenters' suggestions. However, we are modifying our policy to permit a hospital to qualify

if it can demonstrate its inaccessibility for 30 nonconsecutive days in 2 out of the last 3 years before it applies. To clarify this point, we are revising § 412.92(a)(3).

Comment: All the comments we received on our proposal to transfer final processing of the SCH volume adjustment requests to the fiscal intermediaries were favorable. However, several commenters pointed out that we had not discussed hospital appeal rights following this transfer. They also urged HCFA review of the intermediary determinations to ensure timeliness, accuracy, and consistency. One commenter suggested that the current 180-day processing time be reduced to 90 days.

Response: We agree with the commenters' suggestions regarding appeal rights and HCFA oversight of intermediary determinations and we inadvertently neglected to mention these issues in our proposed rule.

Hospitals will retain the same appeal rights of intermediary determinations as they had of HCFA determinations. That is, if a hospital is dissatisfied with the intermediary's final determination, it may request a hearing before the provider Reimbursement Review Board as outlined at § 405.1836. Similarly, although we did not discuss in the proposed rule that we would maintain ongoing review of the intermediaries processing of hospitals' requests, these reviews will be conducted to ensure timeliness, accuracy, and consistency.

With regard to the commenter's suggestions that the allotted 180-day processing time for SCH applications be reduced from 180 to 90 days, we do not believe it is appropriate to impose such a short time frame on the intermediaries at this time. Certainly, we expect the intermediaries to process a hospital's request as rapidly as possible. However, we also recognize that because of other priorities and ongoing workloads, it may not always be possible for the intermediary to complete processing within a 90-day time frame. Therefore, while we are not adopting the commenter's suggestions, we are urging intermediaries to give these requests for volume adjustments a high priority and to process them as rapidly as possible.

Comment: Although we did not propose any changes in the payment methodology used to pay SCHs, we received three comments on this issue. One commenter pointed out that the current payment adjustment provides no incentive for a hospital to become an SCH. Two commenters stated that continuing to base SCH payments on the original base year costs does not adequately reflect current costs.

Response: We are aware that there are many hospitals that are entitled to the SCH adjustment but that have chosen not to apply for it because they receive greater payment under the prospective payment system using the fully national payment rates than they would as an SCH. However, as we have noted in the past, the current methodology is established by law. Therefore, we do not have the authority to alter this method.

We also recognize that, in some instances, it might be advantageous for a hospital to change its SCH status from time to time; that is, in some years, the national payment rates might be greater than the amount a hospital would receive as an SCH and, in other years, the opposite might be true. For this reason, we are relaxing the previous restriction on permitting a hospital to requalify for SCH status once it has relinquished its SCH designation.

Comment: One commenter requested that we clarify which qualifying criteria would be in effect if the criteria change between the time a hospital files for SCH status and the time a final determination is made on its application. The commenter also stated that if the later criteria are more favorable to the hospital, HCFA should permit the hospital to withdraw its application and refile it for consideration under the later criteria.

Response: Generally, a hospital's application will be considered using the criteria in effect at the time it submits its application to its intermediary. However, we agree with the commenter that if revisions to the regulations become effective prior to the HCFA regional office's issuing a final decision on the application, and if the hospital believes the revised criteria are more favorable to it or simplify its documentation requirements, the hospital may request that a determination be based on the later and more favorable criteria.

D. Beneficiary Access to Care in Rural Areas

The nation's rural health care system is undergoing a difficult period of transition in response to several complex factors including changing practice patterns, evolving delivery systems, regional economic change, facility conversion, declining admissions, patient mobility, and demographic change. These factors, coupled with the incentives for efficiency offered by Medicare's prospective payment system, present increasing pressures on the rural health care delivery system.

The challenge facing rural providers, State and local governments, Medicare, and other third-party insurers is to adopt policies that acknowledge the variety of factors affecting the long-term financial viability of rural providers and assure essential access to health care for rural residents.

As a long term initiative, we are evaluating whether refinements to the prospective payment system would be appropriate to improve our payment policy for rural hospitals. This evaluation includes—

- An assessment of whether the special payment protections for SCHs are adequate to provide beneficiaries with continued access to quality care;
- Examination of whether it would be appropriate to establish separate outlier thresholds for cases in urban and rural hospitals; and
- Research to replace the separate urban and rural rates with a single rate adjusted for severity and other factors that explain differential hospital cost experience.

Although we believe that it is important to implement appropriate Medicare payment policies for rural hospitals, we note that the critical issue facing the nation is assuring continued access to health care for all rural residents. Medicare payments account for 34 percent of rural hospitals' total revenues. Other revenue sources, such as Medicaid, private insurance, and self-pay, make up the remaining 66 percent of revenues. A policy involving changes to the Medicare program alone would not be sufficient to assure essential access to rural health care. A viable and effective rural health care policy must involve Federal, State and local governments, and private insurers.

To assist the Department in examining the many important issues affecting this principle of assuring "essential access", in the proposed rule, we requested comments on the following:

- How should the existing SCH policy be reformed and targeted to protect beneficiaries in rural areas with "essential access" problems?
- What are appropriate operational definitions of "essential access" (for example, distance, market share, patient mobility, transportation, weather, or types of essential services provided)?
- What roles should Federal and State government play in identifying "essential access" facilities?
- Should the Federal government and States ensure that Medicaid payment policies acknowledge the need to assure "essential access" to care for beneficiaries in rural areas and, if so, how?

• Should States take actions to encourage third-party payors to acknowledge the need to assure "essential access" to care for rural residents?

• How can the rural transition grant program (authorized by section 4005(e) of Pub. L. 100-203) be targeted to specifically assist "essential access" facilities in planning, coordination, service delivery modification, and conversion efforts?

• How can the Federal government best coordinate rural health policy with those of the State governments?

In order to give the public ample time to respond to the issues raised regarding "essential access" to health care by rural residents, the proposed rule stated that we would accept comments on these issues up to September 30, 1989. Comments on these issues should be submitted to the following address: Health Care Financing Administration, Office of Reimbursement Policy, Division of Hospital Payment Policy, Attn: Rural Access Issues, 1-H-1 East Low Rise, 6325 Security Boulevard, Baltimore, Maryland 21207.

As stated in the proposed rule, because these issues are not directly related to the Medicare prospective payment system, we are not responding to these comments in this final rule. However, we will take them into consideration as we develop a Departmental rural health policy designed to assure essential access to health care in rural areas.

E. Cancer Hospitals (Section 412.94)

Section 1886(d)(5)(C)(iii) of the Act authorizes special treatment for hospitals involved extensively in treatment for and research on cancer. In our regulations at § 412.94(a), we set forth the criteria a hospital must meet to be considered a cancer hospital. In § 412.94(b), we provide that, during its first cost reporting period subject to the prospective payment system, a qualifying cancer hospital may elect to be reimbursed on a reasonable cost basis, subject to the rate of increase limit. We have received inquiries concerning whether the provisions of sections 1815(e)(1) and 1886(g)(3) of the Act, which apply generally to prospective payment hospitals and not to hospitals excluded from the prospective payment system that receive payment on a reasonable cost basis, apply to these cancer hospitals since they are paid on a reasonable cost basis rather than on the basis of a prospective payment rate.

Section 1815(e)(1) of the Act provides that, effective with claims received on or after July 1, 1987, certain requesting

prospective payment hospitals will receive payment for Medicare services on a periodic interim payment (PIP) basis. Under PIP, payment is based on the estimated annual payments for care provided to Medicare patients, and equal biweekly payments are made to hospitals without regard to the submission of individual bills. However, an end-of-year settlement is made once all bills for the year have been submitted and processed. Generally, under the provisions of section 1815(e)(1) of the Act and the regulations that implement it, § 412.116, an otherwise qualifying prospective payment hospital receives PIP only if its intermediary fails to make prompt payment of the hospital's bills, or if the hospital previously qualified as a hospital serving a disproportionate share of low-income patients or as a small rural hospital. Hospitals that are not "subsection (d) hospitals," as well as other providers such as skilled nursing facilities and home health agencies, continue to be eligible for PIP if they meet the other qualifying conditions.

Section 1886(g)(3) of the Act requires, effective October 1, 1986, specified reductions in the amount of payment for capital-related costs of inpatient hospital services of all prospective payment hospitals except sole community hospitals. This provision is set forth in regulation at § 412.113.

Except for sole community hospitals as provided in section 1886(g)(3)(B) of the Act, sections 1815(e)(1) and 1886(g)(3) of the Act apply to all subsection (d) hospitals and subsection (d) Puerto Rico hospitals (as defined in sections 1886(d)(1)(B) and (9)(A) of the Act, respectively). The authority in section 1886(d)(5)(C)(iii) of the Act that permits special treatment under the prospective payment system for a cancer hospital does not alter that hospital's status as a subsection (d) hospital (that is, a prospective payment hospital). Therefore, there is no legislative authority for exempting cancer hospitals from the provisions of sections 1815(e)(1) and 1886(g)(3) of the Act merely because they are paid on the same basis as hospitals excluded from the prospective payment system (that is, on a reasonable cost basis).

We have recently advised the HCFA regional offices to direct fiscal intermediaries that have not already done so to begin applying the provisions of §§ 412.113 and 412.116 to cancer hospitals receiving payments under § 412.94. The intermediaries were directed to apply the provisions of § 412.113 retroactively, beginning with

portions of cost reporting periods occurring during FY 1987 as required by section 1886(g)(3) of the Act. However, the provisions of § 412.116 can not be applied retroactively due to the nature of PIP. Therefore, we directed the intermediaries to terminate current PIP payments to cancer hospitals that do not qualify to receive PIP under the provisions of § 412.116(b)(1) (i), (ii), or (iii). As with other prospective payment hospitals that no longer receive PIP, these cancer hospitals that have their PIP payments terminated will receive payments for inpatient operating costs related to care of Medicare patients on the basis of submitted bills rather than receiving equal biweekly payments.

Accordingly, we proposed to revise § 412.94(b) to clarify that cancer hospitals receiving payment on a reasonable cost basis retain their status as subsection (d) hospitals and are subject to all other regulations governing hospitals subject to the prospective payment system.

Comment: One commenter believes that Congress' intent was to remove PIP and to reduce capital payments only for hospitals subject to the prospective payment system and that such application was not intended to apply to cancer hospitals that qualify for reasonable cost reimbursement under the provisions of § 412.94. The commenter also noted that most Medicare intermediaries continued PIP and unreduced capital payments to the eight cancer hospitals that qualify for reasonable cost reimbursement and that such action is consistent with the intent of Congress.

Several commenters recognized that our clarification of the regulations at § 412.94 is consistent with the statute. However, they recommended that any cancer hospitals currently receiving PIP should continue to receive PIP. The commenters believe that continuation of PIP would prevent operational disruptions in these hospitals and, given the small number of cancer hospitals, would have only a minimal cost impact on the Medicare program.

Finally, one commenter requested that the preamble address whether qualifying cancer hospitals are exempt from the methodology regarding private room differential and from reasonable compensation equivalent (RCE) limits on physician Part A services, computations that are applicable to hospitals subject to the rate of increase limits under section 1886 (a) and (b) of the Act but not to hospitals paid under the prospective payment system.

Response: We believe, as some commenters agreed, that the statute requires application of the PIP provision

and capital reduction provision applicable to prospective payment hospitals to qualifying cancer hospitals since they are also prospective payment hospitals. Therefore, we are required to apply these provisions to cancer hospitals. We believe that we cannot grant an exception to these provisions for the subject cancer hospitals, including, with regard to the PIP provision, cancer hospitals currently receiving PIP. The fact that some intermediaries did not properly apply the PIP and capital reduction provisions to the cancer hospitals is the reason that we are clarifying the regulation.

Section 412.94(b)(1) provides that qualifying cancer hospitals are to be paid on a reasonable cost basis under 42 CFR part 413. The methodology regarding the private room cost differential is set forth in § 413.53. Therefore, the regulations regarding the private room cost differential are applicable to cancer hospitals paid under reasonable cost reimbursement. The RCE limits are included in the regulations at § 405.482. Although the RCE limits are not included in part 413, they are an integral part of the applicable reasonable cost regulations. The latter regulations were formerly codified as subpart D of Part 405. When the prospective payment regulations now in Part 412 were recodified on March 29, 1985, all the reasonable cost regulations, including the RCE limits, were in subpart D. When the reasonable cost regulations were recodified as part 413 on September 30, 1986, certain regulations pertaining to teaching hospitals and provider-based physicians were not so recodified but remained in subpart D. However, the reference to the reasonable cost regulations in § 412.94 was changed from "subpart D of part 405" to "part 413". (See 51 FR 34793 (September 30, 1986).) Although not all the reasonable cost regulations were included in this new designation as they had been by the former designation, there was no intent to change their applicability. As we stated at the time, "In no instance do we intend any of the amendments to affect the substance of the Medicare rules." (51 FR 34790.) Thus, the applicability of the RCE limits to cancer hospitals did not change. They remain an integral part of determining payment for physician Part A services to a hospital that is paid on a reasonable cost basis. For § 412.94 cancer hospitals, payment is made under the reasonable cost regulations in part 413 and elsewhere and not under the prospective payment provisions of part 412. Therefore, these limits are applicable in determining the reasonable cost reimbursement for cancer hospitals. We

have revised § 412.94(b)(1) to refer to the reasonable cost provisions of both subparts D and E of part 405.

F. Rural Referral Centers (Section 412.96)

Under the authority of section 1886(d)(5)(C)(i) of the Act, § 412.96 sets forth the criteria a hospital must meet in order to receive special treatment under the prospective payment system as a referral center (that is, payment is based on the other urban payment rate rather than the rural payment rate). One of the criteria under which a rural hospital may qualify as a referral center is to have 275 or more beds available for use.

A rural hospital that does not meet the bed size criterion can qualify as a rural referral center if the hospital meets two mandatory criteria (number of discharges and case-mix index) and at least one of three optional criteria (medical staff, source of inpatients, or volume of referrals). With respect to the two mandatory criteria, currently a hospital is classified as a rural referral center if its—

- Case-mix index is equal to the lower of the median case-mix index for urban hospitals in its census region, excluding hospitals with approved teaching programs, or the median case-mix index for all urban hospitals nationally; and

- Number of discharges is at least 5,000 discharges per year or, if fewer, the median number of discharges for urban hospitals in the census region in which the hospital is located. (We note that the number of discharges criterion for an osteopathic hospital is at least 3,000 discharges per year.)

1. Case-Mix Index

Section 412.96(c)(1) provides that HCFA will establish updated national and regional case-mix index values in each year's annual notice of prospective payment rates for purposes of determining referral center status. In determining the proposed national and regional case-mix index values, we followed the same methodology we used in the November 24, 1986 final rule, as set forth in regulations at § 412.96(c)(1)(ii). Therefore, the proposed national case-mix index value includes all urban hospitals nationwide and the proposed regional values are the median values of urban hospitals within each census region, excluding those with approved teaching programs (that is, those hospitals receiving indirect medical education payments as provided in § 412.118).

These values are based on discharges occurring during FY 1988 (October 1,

1987 through September 30, 1988) and include bills posted to HCFA's records through December 1988. Therefore, in addition to meeting other criteria, we proposed that to qualify for or to retain rural referral center status for cost reporting periods beginning on or after October 1, 1989, a hospital's case-mix index value for FY 1988 would have to be at least—

- 1.2187; or
- Equal to the median case-mix index value for urban hospitals (excluding hospitals with approved teaching programs as identified in § 412.113) calculated by HCFA for the census region in which the hospital is located as indicated in the table below.

	Region	Case-mix index value
1.	New England (CT, ME, MA, NH, RI, VT).....	1.1598
2.	Middle Atlantic (PA, NJ, NY).....	1.1595
3.	South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV).....	1.2107
4.	East North Central (IL, IN, MI, OH, WI).....	1.1644
5.	East South Central (AL, KY, MS, TN).....	1.1598
6.	West North Central (IA, KS, MN, MO, NB, ND, SD).....	1.1742
7.	West South Central (AR, LA, OK, TX).....	1.2082
8.	Mountain (AZ, CO, ID, MT, NV, NM, UT, WY).....	1.2379
9.	Pacific (AK, CA, HI, OR, WA).....	1.2272

Based on the latest data available (through June 1989), the final national case-mix index value is 1.2205 and the median case-mix index values by region are set forth in the table below.

	Region	Case-mix index value
1.	New England (CT, ME, MA, NH, RI, VT).....	1.1681
2.	Middle Atlantic (PA, NJ, NY).....	1.1591
3.	South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV).....	1.2122
4.	East North Central (IL, IN, MI, OH, WI).....	1.1555
5.	East South Central (AL, KY, MS, TN).....	1.1615
6.	West North Central (IA, KS, MN, MO, NB, ND, SD).....	1.1741
7.	West South Central (AR, LA, OK, TX).....	1.2094
8.	Mountain (AZ, CO, ID, MT, NV, NM, UT, WY).....	1.2402
9.	Pacific (AK, CA, HI, OR, WA).....	1.2432

For the benefit of hospitals seeking to qualify as referral centers or those wishing to know how their case-mix index value compares to the criteria, we are publishing the FY 1988 case-mix index values in Table 3c in section IV of the addendum to this final rule. In keeping with our policy on discharges, these case-mix index values are

computed based on all Medicare patient discharges subject to DRG-based payment.

2. Discharges

Section 412.96(c)(2)(i) provides that HCFA will set forth the national and regional numbers of discharges in each year's annual notice of prospective payment rates for purposes of determining referral center status. As specified in section 1886(d)(5)(C)(i)(II) of the Act, the national standard is set at 5,000 discharges. However, we proposed to update the regional standards, which are based on discharges for urban hospitals during the fourth year of the prospective payment system (that is, October 1, 1986 through September 30, 1987), which is the latest year for which we have complete discharge data available.

Therefore, in addition to meeting other criteria, we proposed that to qualify for or to retain rural referral center status for cost reporting periods beginning on or after October 1, 1989, a hospital's number of discharges for its cost reporting period that began during FY 1988 would have to be at least—

- 5,000; or
- Equal to the median number of discharges for urban hospitals in the census region in which the hospital is located as indicated in the table below.

	Region	Number of discharges
1.	New England (CT, ME, MA, NH, RI, VT).....	6749
2.	Middle Atlantic (PA, NJ, NY).....	8138
3.	South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV).....	6451
4.	East North Central (IL, IN, MI, OH, WI).....	7850
5.	East South Central (AL, KY, MS, TN).....	6113
6.	West North Central (IA, KS, MN, MO, NB, ND, SD).....	5832
7.	West South Central (AR, LA, OK, TX).....	4528
8.	Mountain (AZ, CO, ID, MT, NV, NM, UT, WY).....	7403
9.	Pacific (AK, CA, HI, OR, WA).....	4927

Based on the latest discharge data available, the final median number of discharges by census region are set forth in the table below.

	Region	Number of discharges
1.	New England (CT, ME, MA, NH, RI, VT).....	6599
2.	Middle Atlantic (PA, NJ, NY).....	7750
3.	South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV).....	6328
4.	East North Central (IL, IN, MI, OH, WI).....	7287

	Region	Number of discharges
5.	East South Central (AL, KY, MS, TN).....	5841
6.	West North Central (IA, KS, MN, MO, NB, ND, SD).....	5683
7.	West South Central (AR, LA, OK, TX).....	4586
8.	Mountain (AZ, CO, ID, MT, NV, NM, UT, WY).....	7203
9.	Pacific (AK, CA, HI, OR, WA).....	5296

We again note that to qualify for or to retain rural referral center status for cost reporting periods beginning on or after October 1, 1989, an osteopathic hospital's number of discharges for its cost reporting period that began during FY 1988 would have to be at least 3,000.

3. Retention of Referral Center Status

In the August 31, 1984 final rule, we announced that we were instituting a periodic review of the status of hospitals that qualified for a payment adjustment as referral centers (49 FR 34746). That final rule stated that this review would allow us to determine if these hospitals continued to meet the criteria for referral center status. The final rule stated that we would grant referral center status to a hospital for a 3-year period. At the end of the 3 years, we would evaluate a hospital's performance in meeting the criteria for qualifying as a referral center. A hospital would have been required to meet the criteria for at least 2 of those 3 years. If it did, the hospital would retain its referral center status for another 3-year period. If the hospital did not meet the criteria for at least 2 of the 3 years, the hospital's status as a referral center would end with the last day of the third cost reporting period for which it received the referral center payment adjustment.

Before we were able to implement this review, the Omnibus Budget Reconciliation Act of 1986 (Pub. L. 99-509) was enacted on October 21, 1986. Section 9302(d)(2) of Pub. L. 99-509 stated that any hospital that was classified as a rural referral center on the date of the enactment of that law will continue to be classified as a referral center for cost reporting periods beginning on or after October 1, 1986 and before October 1, 1989. Thus, any hospital that was classified as a referral center as of October 21, 1986 (the date of enactment of Pub. L. 99-509) is guaranteed this status through its cost reporting period beginning before October 1, 1989.

We believe it is important that the rural referral center benefit be available only to those hospitals that continue to be in compliance with the statutory

criteria for designation. Therefore, with the expiration of the requirement of section 9302(d)(2) of Pub. L. 99-509 on October 1, 1989, we proposed to implement essentially the same retention criteria and methodology specified in § 412.96(f) that we had developed prior to the enactment of Pub. L. 99-509 with one variation. These previous criteria and methodology were discussed in the June 10, 1985 proposed rule (50 FR 24380) and the September 3, 1985 final rule (50 FR 35676).

Basically, to retain status as a referral center, a hospital must meet the criteria for classification as a referral center specified in § 412.96(b) or (c) for at least 2 of the 3 years after it qualifies as a referral center or it must qualify on the basis of the requirements for the current year. A hospital may meet the specific criteria in either paragraph for individual years during the 3-year period or the current year. For example, a hospital may meet the two mandatory requirements in § 412.96(c)(1) (case-mix index) and (c)(2) (number of discharges) and the optional criterion in paragraph (c)(3) (medical staff) during the first year. During the second and third year, the hospital may meet the criteria under § 412.96(b)(1) (rural location and appropriate bed size).

A hospital must meet all of the criteria within any section of the regulations in order to meet the retention criteria for a given year. That is, it must meet all of the criteria of § 412.96(b)(1) or § 412.96(b)(2) or § 412.96(c). For example, if a hospital meets the case-mix index standards in § 412.96(b)(2) in years 1 and 3 and the number of discharge standards in years 2 and 3, it would not meet the retention criteria. All of the standards must be met in the same year.

When we begin implementation of the provisions of § 412.96(f), some hospitals will have been classified as referral centers for more than 3 years without having been reviewed for continuing compliance with the referral center criteria. We proposed that the review process be limited to the hospital's compliance during the last 3 years. Thus, if a hospital meets the criteria for at least 2 of the last 3 years or for the current year, it would retain its status for another 3 years. No hospital would be subject to a review until the end of its third full cost reporting period as a referral center. Therefore, those hospitals that first qualified as referral centers as of April 1, 1988 by virtue of having at least 275 beds will not be subject to review until the end of their third full cost reporting period as a referral center.

In the past few years, there have been several changes in the methodology used to set the case-mix index and the number of discharges criteria. We have constructed the following chart and example to aid hospitals that qualify as referral centers under the criteria in § 412.96(c) in projecting whether they will retain their status as a referral center.

Under § 412.96(f), to qualify for a 3-year extension effective with cost reporting periods beginning in FY 1990, a hospital must meet the mandatory criteria in § 412.96(c) for FY 1990 or it must meet the criteria for 2 of the last 3 years as follows.

For the cost reporting period beginning during FY	Use hospital's case-mix index for FY	Use the discharges for the hospital's cost reporting period beginning during FY	Use numerical standards as published in the Federal Register on
1990	1988	1988	Sept. 1, 1989.
1989	1987	1987	Sept. 30, 1988.
1988	1986	1986	Sept. 1, 1987.
1987	1985	1985	Nov. 24, 1986 and Aug. 24, 1987.

Example: A hospital with a cost reporting period beginning July 1 qualified as a referral center effective July 1, 1985. The hospital has fewer than 275 beds. Its status as a referral center is protected through the end of its cost reporting period beginning July 1, 1989. To determine if the hospital should retain its status as a referral center for an additional 3-year period, we would review its compliance with the applicable criteria for its cost reporting periods beginning July 1, 1987, July 1, 1988, July 1, 1989, and July 1, 1990. The hospital must meet the criteria either for its cost reporting beginning July 1, 1990 or for two out of the three past periods. For example, to be found to have met the criteria at § 412.96(c)(2) for its cost reporting period beginning July 1, 1988, the hospital's case-mix index value during FY 1986 must have equaled or exceeded the lower of the national or the appropriate regional standard as published in the September 1, 1987 final rule. The hospital's total number of discharges during its cost reporting year beginning July 1, 1986 must have equaled or exceeded 5000 or the regional standard as published in the September 1, 1987 final rule.

For those hospitals that seek to retain referral center status by meeting the

criteria of § 412.96(b)(1) and (b)(1)(ii) (that is, rural location and appropriate bed size (500 or more beds for discharges occurring before April 1, 1988 and 275 or more beds thereafter)), we would look at the number of beds shown for indirect medical education purposes (as defined at § 412.118(b)) on the hospital's cost report for the appropriate year. As discussed above, we would consider only full cost reporting periods beginning on or after April 1, 1988 when determining a hospital's status under § 412.96(b)(1)(ii). This definition varies from the bed size criterion used to determine a hospital's initial status as a referral center because we believe it is important for a hospital to demonstrate that it has maintained at least 275 beds throughout its entire cost reporting period, not just for a particular portion of the year.

In the proposed rule, we projected that 25 percent of hospitals currently designated as rural referral centers will not meet the retention criteria. We are revising this figure to 19 percent based on more current data. Our projection is based on comparison of the existing rural referral centers' actual case-mix index values and number of discharges to the lower of the national or regional standards for the applicable years. Approximately 80 percent of the hospitals we project will not retain their status did not meet the proposed case-mix index criterion for qualifying as a rural referral center in FY 1990; based on MEDPAR data processed through December 31, 1988, the average case-mix index value for the hospitals not meeting the case-mix index criterion is six percent lower than the applicable criterion. Approximately 40 percent of the hospitals that we project will not retain status failed to meet the discharge standards. Twenty-five percent met neither the discharge nor the case-mix index criterion for FY 1990 or for 2 out of the last 3 years.

We received many comments concerning the various aspects of payment to rural referral centers. These comments and our response follow.

Comment: Several commenters suggested revisions in the manner in which we set the national and regional case-mix index criteria. That is, some believed that the case-mix index criteria should be based on the mean case-mix index of urban hospitals rather than on the median which we now use. One commenter suggested that we establish a hospital's average case-mix index value over a 3-year period and compare it to the average case-mix index value of urban hospitals for the same 3-year period. One commenter suggested that

we develop "proper" case-mix index criteria, but did not elaborate further. Finally, one commenter stated that establishing the case-mix index criterion standards at the median was unfair since it means that a rural hospital must maintain a case-mix index value higher than 50 percent of all urban hospitals.

Response: Section 9302(d)(1) of the Omnibus Budget Reconciliation Act of 1986 (Pub. L. 99-509) amended section 1886(d)(5)(C)(i) of the Act to statutorily establish case-mix index, annual number of discharges, and "any other criteria established by the Secretary" as one method under which a rural hospital can qualify as a rural referral center. Section 1886(d)(5)(C)(i)(II) of the Act specifically requires that a rural hospital have "a case mix equal to or greater than the median case mix for hospitals (other than hospitals with approved teaching programs) located in an urban area in the same region * * * (emphasis added). Thus, we believe we are prohibited by law from implementing any of the suggestions offered.

We believe the current methodology is an equitable measure of the complexity of the cases treated by a hospital. As we have noted in previous discussions, Congress intended that the rural referral center adjustment be granted only to large facilities that treat "patients who require an intensity of resources beyond the capabilities of general community hospitals." [120 Cong. Rec. S3224-3226 (daily ed. March 17, 1983).] Congress also described referral centers as "large, technologically sophisticated hospitals * * * which are characterized by high case mix indices, diverse geographical patient origin, and numerous multidisciplinary medical education programs." [129 Cong. Rec. S3224-3226 (daily ed. March 17, 1983).] Thus, we believe Congress intended that qualification as a rural referral center be limited to those rural hospitals that can demonstrate through maintenance of high case-mix index values that they are truly providing highly specialized and intensive care.

In addition to the fact that the law requires that we establish the qualifying standards using the median case-mix index value of urban hospitals, we also believe the median is the appropriate measure. Means can be skewed by extremes either at the upper or lower ends. The median is less likely to be significantly altered by such extremes.

Finally, section 1886(d)(5)(C)(i)(I) of the Act, as originally added by section 2311(a) of the Deficit Reduction Act 1984 (Pub. L. 98-369), specifically states that certain operating characteristics of rural referral centers should be similar to

those of a typical urban hospital located in the same census region. We believe the median more accurately reflects the typical urban hospital than would the mean. For these reasons, we do not believe it is unreasonable to expect rural hospitals seeking rural referral center status to meet a standard that exceeds that of 50 percent of the urban hospitals.

Comment: Although we did receive one favorable comment, many commenters disagreed with our proposal to implement triennial reviews of approved rural referral centers. Commenters' alternative suggestions to our proposal included extension of the grandfathering provision for 3 to 5 years, eliminating the reviews altogether, or delaying implementation of the review until proposed legislation that would extend the grandfathering provision has been acted upon.

Response: We continue to believe that it is equitable and reasonable to review periodically approved rural referral centers' compliance with the criteria in the statute and regulations to ensure that only those hospitals that are truly functioning as rural referral centers receive the special adjustment. Some hospitals qualified as rural referral centers based on their case-mix index values and number of discharges from 1981 and have not met the criteria since that time. We do not believe it is fair to the remaining rural hospitals to continue to recognize these hospitals as rural referral centers. Thus, we do not agree with the commenters who suggested either not doing the reviews at all or delaying them for several years.

We have compared data from the two groups of rural referral centers (those projected to retain their status and those projected to lose their status) to rural hospitals that are not referral centers and to hospitals located in other urban areas. These data show that the hospitals projected to retain referral center status do, in fact, bear a marked similarity to hospitals in other urban areas in comparison of both case-mix index values and numbers of discharges. Similarly, the statistics of rural referral centers projected to lose their status more closely resemble those of all other rural hospitals. For example, the rural hospitals retaining referral center status had an average case-mix index value of 1.2289 compared to an average case-mix index value of 1.2753 for hospitals in other urban areas; discharges averaged 8,185 and 8,009, respectively. The rural referral centers projected to lose their status had an average case-mix index value of 1.1275 and discharges of 5,412, which, while above the averages of 1.0739 and 1,753 for all other rural

hospitals, are still enough lower than the statistics of other urban hospitals to illustrate their dissimilarity. In addition, we compared the FY 1987 average cost per case of rural referral centers projected to retain their status (\$3,192) to the average cost per case of other urban hospitals (\$3,967). The average cost per case for the referral centers projected to lose their status was \$2,896 while that of all other rural hospitals was \$2,462.

We believe that all of these data demonstrate that those rural referral centers that we project will lose their status more closely resemble other rural hospitals than they do other urban hospitals. We believe these data support reimplementation of the periodic reviews of rural referral center and the retention of only those hospitals that continue to meet the qualifying criteria.

With regard to proposed legislation that would extend the grandfathering provision, we cannot set policy or delay implementing regulatory provisions based on pending legislation that may be enacted in any one of several forms or may not be enacted at all. If legislation that has an impact on our policy concerning rural referral centers is enacted, we will comply with it as rapidly as possible.

Comment: One commenter suggested that the criteria to retain rural referral center status should be limited to case-mix index and referrals only and should not include number of discharges. Another commenter stated that the 5,000 national discharge standard that must be met to qualify for rural referral status is arbitrary and irrelevant in view of declining hospital utilization. A third commenter requested that we publish the specific number of Medicare discharges by hospital as we do case-mix index values, so that these numbers can be reviewed for accuracy.

Response: As noted above, section 1886(d)(5)(C)(i)(II) of the Act requires that we consider a rural hospital's annual number of total discharges along with its case-mix index value (as well as optional criteria as determined by the Secretary) in classifying rural hospitals as rural referral centers under this section. Specifically, that section of the Act requires that a hospital have "at least 5,000 discharges a year or, if less, the median number of discharges in urban hospitals in the region in which the hospital is located. . . ." (We note that this section also provides that rural osteopathic hospitals must have 3,000 annual discharges.)

Thus, the fact that a hospital must maintain a specific number of discharges annually is not only a

statutory requirement, but the national level of 5,000 is also set by law, as is the requirement that the regional standards must be determined based on the median number of discharges from urban hospital in the same census region. Therefore, we do not have the authority to eliminate discharges as a standard or to alter the national number required. In addition, we believe it is reasonable to require a hospital to meet the same standards to retain rural referral center status as must be met to acquire that status during any given year.

It should also be noted that the 5,000 discharges standard is lower than the median number of discharges from eight of the nine census regions. In some regions, it is significantly lower (by more than 2,750 discharges annually in census region 2). In addition, data taken from hospital cost reports for cost reporting periods beginning during FYs 1987 and 1988 show that, on a national basis, although the median number of discharges from rural hospitals declined from 1,451 in 1987 to 1,403 in 1988, the median number of discharges from urban hospitals actually increased from 6,314 in 1987 to 6,335 in 1988. In view of these statistics, we believe the 5,000 total discharges standard is quite reasonable. Therefore, we are not adopting the commenters' suggestions.

Regarding the suggestion that we publish the annual number of Medicare discharges for verification purposes, we are uncertain how such information would benefit hospitals seeking rural referral center status. A hospital's total annual discharges are considered in determining its qualification as a rural referral center—not just its Medicare discharges. That number is obtained from the hospital's cost report for the appropriate year; the number of Medicare discharges is not a consideration in determining rural referral center status.

Although annual Medicare discharges may be obtained from central office records, we do not believe the number alone is of significance for hospitals in determining rural referral center status. In addition, since, for purposes of qualifying as a rural referral center, a hospital's discharges are determined based on each hospital's cost reporting year, it would be an administrative expense for HCFA to provide Medicare discharge information based on each hospital's cost reporting period.

Therefore, we are not adopting the commenter's suggestion.

Comment: We received one comment suggesting that since the change in the rural referral center policy will have an impact on payments to hospitals, it should be implemented in a budget-neutral fashion.

Response: It has not been our practice to make budget neutrality adjustments to reflect increases or decreases in aggregate payments due to changes in hospital status for special payment provisions except when we have been required to do so by the statute. For example, although we made a budget neutrality adjustment as required by section 9302(d)(3) of Pub. L. 99-509 when the rural referral center case-mix index criterion was revised to exclude teaching hospitals effective for cost reporting periods beginning on or after October 1, 1986, we did not make subsequent adjustments to the payment rates for additional payments made to newly qualifying referral centers after that date and before the bed-size criterion was lowered effective April 1, 1988 by section 1886(d)(5)(C)(i)(I) of the Act. Therefore, we do not believe we should adjust the rates when hospitals no longer qualify. We have also taken this position for disproportionate share hospitals which must qualify annually for additional payments under the disproportionate share hospital provision.

Moreover, we believe a budget neutrality adjustment would be premature. Our projection of how many hospitals will not retain referral center status is based on available information; for example, we have used FY 1987 discharges in our estimate. We will not actually know how many hospitals lose their rural referral center status until the retention status determination is made by the Regional Office. This determination will include consideration of the hospitals' FY 1988 discharges. Also, affected hospitals will not lose their rural referral center status until the beginning of their next cost reporting period, which in many cases will be well into the next Federal fiscal year.

G. Disproportionate Share Adjustment (Section 412.106)

Section 8401 of Pub. L. 100-647 amended section 1886(d)(5)(F)(i) of the Act to extend payment of the disproportionate share adjustment through discharges that occur before

October 1, 1995. Prior to enactment of Pub. L. 100-203, the payment adjustment for disproportionate share hospitals was to be made only through discharges occurring before October 1, 1990. We proposed to revise § 412.106(b)(1) and (b)(2) to conform our regulations with this statutory provision. We received no comments on this provision. Therefore, we are adopting our changes as proposed. However, we are taking this opportunity to clarify the regulations at § 412.106, which deal with the adjustment for disproportionate share hospitals. These revisions are not intended to revise the regulations (except for the change required by section 1886(d)(5)(F)(i) of the Act described above), but are merely designed to make the regulations easier to read and understand.

H. Indirect Medical Education Costs (Section 412.118)

Section 1886(d)(5)(B) of the Act provides that prospective payment hospitals that operate medical education programs receive an additional payment for the indirect costs of medical education. The regulations governing the calculation of this additional payment are set forth at § 412.118. Each hospital's additional indirect medical education payment is determined by multiplying the hospital's total DRG revenue by the applicable education adjustment factor.

Section 4003(a) of Pub. L. 100-203 revised section 1886(d)(5)(B)(ii) of the Act to reduce the education adjustment factor used to determine the indirect medical education payment for approximately 8.1 percent to approximately 7.7 percent for discharges occurring on or after October 1, 1988 and before October 1, 1990. Section 8401 of Pub. L. 100-647 extended the applicability of this education adjustment factor through discharges occurring before October 1, 1995. We note that the education adjustment factor is an approximation because the adjustment factor is applied on a curvilinear or variable basis. An adjustment made on a curvilinear basis reflects a nonlinear cost relationship; that is, each absolute increment in a hospital's ratio of interns and residents to beds does not result in an equal proportional increase in costs.

For discharges occurring on or after October 1, 1988 and before October 1, 1995, the indirect medical education factor equals the following:

$$1.89 \times \left[\left(1 + \frac{\text{interns and residents}}{\text{beds}} \right) .405 - 1 \right]$$

For discharges occurring on or after October 1, 1995, the indirect medical education factor equals the following:

$$1.43 \times \left[\left(1 + \frac{\text{interns and residents}}{\text{beds}} \right) .5795 - 1 \right]$$

We proposed to amend § 412.118 (c) and (d) to implement the provisions of amended section 1886(d)(5)(B)(ii) of the Act. We received no comments on these changes; therefore, they are adopted as proposed.

I. Interim Payment Provision for Hospitals with Unusually Long Lengths of Stay (Section 412.116)

On August 15, 1986, we published a final rule, effective for discharges occurring on or after July 1, 1987, which provided for the elimination of the PIP method of payment for all hospitals (51 FR 29386) except for services furnished by rural hospitals with fewer than 100 beds. Under PIP, a hospital is paid on an interim basis for services furnished to beneficiaries. These interim payments are based on the hospital's projected annual costs (for hospitals excluded from the prospective payment system) or payments under the prospective payment system for Medicare patients and are made in equal biweekly payments to the hospital without regard to the submission of individual bills. Any overestimation or underestimation of the hospital's actual costs or total prospective payments to the extent not adjusted during the year is adjusted at the time of cost report settlement.

Because prospective payments are based on discharge information and, therefore, cannot be made until after discharge, in the August 15, 1986 final rule, we included a provision for special interim payments for unusually long lengths of stay in prospective payment hospitals no longer receiving PIP. Under that provision, a hospital was permitted to request an interim payment if a Medicare beneficiary's stay exceeded 30 days. The amount of the interim payment was equal to the hospital's Federal rate per discharge multiplied by the appropriate DRG weighting factor. Only one interim payment per discharge was permitted. The amount of the interim payment was to be deducted from the final payment determined

following the patient's discharge. No such provision was made for hospitals excluded from the prospective payment system since payment to these hospitals is not made on a per discharge basis and they have the option of submitting interim bills during an unusually long stay.

The provisions of the August 15, 1986 final rule were effectively invalidated by section 9311(a) of the Omnibus Budget Reconciliation Act of 1986 (Pub. L. 99-509), which added section 1815(e) of the Act to set forth specifically the circumstances under which PIP is available for services furnished by hospitals and other providers. Generally, inpatient hospital services furnished by hospitals excluded from the prospective payment system, as well as skilled nursing facility services, home health services, and hospice care, may be paid on a PIP basis. With certain exceptions, inpatient hospital services furnished by prospective payment hospitals are not eligible for payment on a PIP basis. Subsequently, we published a final rule with comment period on January 21, 1988 (53 FR 1621) which, in addition to implementing the provisions of section 1815(e) of the Act, eliminated the provision allowing a special interim payment for long stay cases set forth in the August 15, 1986 final rule.

In response to the January 21, 1988 final rule, we received a number of comments objecting to the elimination of the provision for special interim payments for unusually long lengths of stay. These commenters cited that we had originally provided for the special interim payments in order to alleviate the cash flow problems that certain hospitals might encounter after they no longer received PIP. The commenters indicated that a cash flow shortage continues to be a problem for a hospital that cannot receive any Medicare payment for a patient who has been in the hospital for an unusually long time. Some commenters believed that the problem was more acute for small

hospitals or for rural hospitals, but all believed that not receiving an interim payment for a long-stay patient represented a hardship to the hospital. Others commented that the problem is exacerbated by the fact that the number of patients remaining in their hospitals awaiting skilled nursing facility (SNF) placement is increasing due to the shortage of beds in Medicare-participating SNFs in their areas.

In addition to the hardships raised by the commenters, the enactment on July 1, 1988 of the Medicare Catastrophic Coverage Act of 1988 (Pub. L. 100-360) has had an adverse impact on prospective payment hospitals with unusually long lengths of stay. Before enactment of Pub. L. 100-360, a beneficiary was entitled to 90 days of inpatient hospital services during each spell of illness. In addition, a beneficiary could draw from a lifetime reserve of 60 days if that beneficiary's inpatient hospital days exceeded 90 days in a spell of illness. However, under section 1812(a)(1) of the Act, as amended by section 101(b) of Pub. L. 100-360, essentially unlimited inpatient hospital days are available for Medicare beneficiaries effective with services furnished on or after January 1, 1989. Therefore, effective January 1, 1989, in extremely long stay cases, Medicare payment for benefits that previously would have been exhausted will continue to accrue until discharge.

In light of the comments discussed above and the changes made by Pub. L. 100-360, we have reconsidered our position with respect to providing some form of special interim payment to prospective payment hospitals for long stays. We are revising the regulations at § 412.116 to state that hospitals subject to the prospective payment system that are not on PIP may request a special interim payment after a patient has been in the hospital at least 60 covered days and may request additional interim payments thereafter at intervals of at least 60 days. We believe that this

policy represents a reasonable and equitable solution for those hospitals that, with respect to extremely long stay cases, have been adversely affected by the elimination of PIP.

The amount of the initial interim payment will be equal to the rate for the DRG that results from applying the Grouper classification to the diagnosis, procedures, and other pertinent information that is reported on the initial interim bill. The payment for the initial interim bill will be determined as if the bill were the final bill. That is, the intermediary will pay the hospital based on the DRG determined for the bill plus any outlier payments as of the date of the last day for which services have been billed. Subsequent interim bills, including the final bill, will be processed as adjustment bills, with payment determined as if the bill were the final bill. Generally, the adjusted payment from subsequent bills will result from outlier payments accruing since the previous bill. These special interim payments are effective [date of publication] for all qualifying current and subsequent inpatient hospital admissions.

As we stated above, this change to our payment policy is made primarily in response to the comments received on the January 21, 1988 final rule with respect to the special interim payments issue. We have made our final determination on this issue and are publishing it at this time because we believe it to be of paramount importance to the hospital industry as well as in the best interest of the public to issue as soon as possible. The other comments submitted in response to the January 21 final rule will be addressed in a separate document to be published in the future.

V. Other ProPAC Recommendations

As required by law, we reviewed the March 1, 1989 report submitted by ProPAC and gave its recommendations careful consideration in conjunction with the proposals set forth in the proposed rule. We also responded to the individual recommendations in the proposed rule. The comments we received on our treatment of the ProPAC recommendations are set forth below along with our responses to those comments. However, if we received no comments from the public concerning a ProPAC recommendation or our response to that recommendation, we have not repeated the recommendation and response in the discussion below. Recommendations 1 through 7 concerning the update factors are discussed in Appendix B of this document. Recommendation 13

concerning reassignment of patients with Guillain-Barre syndrome is discussed in section II.B. of this preamble.

A. Adjustments to the Prospective Payment System Payment Formula

Indirect Medical Education Adjustment (Recommendation 8)

Recommendation: The Secretary should seek legislation to reduce the indirect medical education adjustment from 7.7 percent to 6.6 percent for FY 1990. This reduction should be implemented in a budget neutral fashion with the savings returned to all hospitals through corresponding increases in the standardized amounts. ProPAC estimates that the indirect medical education adjustment should be 4.4 percent. However, concern about implementing such a large reduction led ProPAC to recommend that only one-third of the total reduction be implemented this year. ProPAC also recommends that further reductions should be made only after review of costs and analysis of impact.

Response in the Proposed Rule: We agree that the current indirect medical education adjustment paid to teaching hospitals is excessive and should be reduced. We believe that the adjustment should be reduced to 4.05 percent for each 10 percent increment in the intern and resident-to-bed ratio applied on a curvilinear basis. That figure represents our estimate of the actual impact of the indirect costs of teaching activity on hospital costs. We note that this figure does not differ significantly from the ProPAC estimate, which is 4.4 percent for each 10 percent increment in the ratio of interns and residents-to-beds.

Our analyses indicate that teaching hospitals have had favorable Medicare operating margins under the prospective payment system. Hospitals, on average, experienced operating margins of 5.3 percent during FY 1987. Teaching hospitals, on the average, experienced higher Medicare operating margins. Teaching hospitals with an intern and resident-to-bed ratio of less than 25 percent had Medicare operating margins of 7.6 percent during FY 1987; teaching hospitals with greater than a 25 percent intern and resident-to-bed ratio had Medicare operating margins of 13.6 percent on average during FY 1987.

We believe that teaching hospitals have fared exceptionally well under the prospective payment system and are able to absorb a reduction in the indirect medical education adjustment. Therefore, while we recognize that a change in the adjustment from 7.7 percent to 4.05 percent is sizeable, we

do not believe that gradually reducing the adjustment, as ProPAC has recommended, is justified. Moreover, in view of the budgetary constraints, we believe it would be inappropriate to pay in excess of the estimate of the actual indirect costs of teaching activity. Further, because we believe payments to other hospitals are adequate, we believe that the change in the indirect medical education adjustment formula should not be implemented in a budget neutral fashion.

Comment: Several commenters objected to our recommendation concerning the adjustment factor for indirect medical education. Some commenters urged that we accept ProPAC's recommendation for a phased-in reduction of the adjustment, that is, for FY 1990, from 7.7 to 6.6 percent. Others objected to any reduction in the adjustment.

Response: We want to note that we did not propose to reduce the adjustment for indirect medical education in the proposed rule. Since the current adjustment is required by section 1886(d)(5)(B)(ii) of the Act, any change to the formula would require legislation. In the proposed rule, we were responding to a recommendation submitted by ProPAC that the Secretary seek legislation to reduce the adjustment formula. We responded that we concurred with ProPAC that the current formula results in an adjustment that is excessive and indicated that we believe the adjustment should be reduced from the current 7.7 percent to 4.05 percent (54 FR 19655).

We based our recommendation on the results of a 1985 study conducted by the Congressional Budget Office (CBO) that shows that the average cost per Medicare discharge increases by 4.05 percent for each 10 percent increase in the intern-to-bed ratio. A more recent study conducted by CBO ("Setting Medicare's Indirect Teaching Adjustment for Hospitals," May 1989) found that, depending on the model used, the adjustment factor could range from a low of 3.5 percent to a high of 5.2 percent. In addition, a study by the General Accounting Office (GAO) (as well as the ProPAC study) confirms that the current adjustment is excessive. (GAO Report No. HRD-89-33, January 5, 1989, "Medicare Indirect Medical Education Payments Are Too High.") GAO used several different models to estimate the effect of teaching programs on Medicare inpatient operating costs per discharge. Depending on the model used in the analysis, GAO estimated that the teaching effect on the Medicare cost per discharge ranges from 3.73

percent to 6.51 percent. The model that includes the Medicare payment variables, outlier cases, and bed size estimates the teaching effect at 4.05 percent.

B. Quality of Care

Evaluation of PRO Review of Quality of Care (Recommendation 14)

Recommendation: The Secretary should evaluate the impact of the PROs on quality of care. Intensified analysis of the PRO findings and validation of the PRO quality review process should be included in the evaluation. The validity, reliability, and efficiency of the PRO quality screens should receive special emphasis in the evaluation. In addition, the Secretary should continue to develop, test, and implement more sophisticated methods of inpatient and outpatient quality review. The Secretary should also develop additional mechanisms to identify and evaluate quality of care beyond the immediate period of hospitalization, placing more emphasis on outcomes of care.

Response in the Proposed Rule: We agree with the recommendation for evaluation of the impact of PROs on quality of care. We have the following two mechanisms in place that evaluate a PRO's application of quality screens:

- An independent contractor, the so-called "SuperPRO" (currently Systemetrics, Inc.), validates the determinations made by a PRO specifically to identify quality issues that should have been addressed by the PRO using generic screening criteria. This review is a rereview of the medical records originally examined by the PRO. Whenever discrepancies arise, the PRO is given an opportunity to rebut the SuperPRO's findings. The final SuperPRO decisions are used as educational tools for PROs. HCFA also reviews these decisions to identify areas in which corrective action is needed. During the PRO contract negotiations, SuperPRO findings, including those related to generic quality screens, will be considered in the PRO evaluation process.

- The Peer Review Organization Monitoring Protocol and Tracking System (PROMPTS) monitors the PROs performance in the area of quality of care. PROMPTS involves regional office rereview of PRO clinical decisions, including generic screen failures. If the regional office disagreements with a PRO's decisions exceeds a specific threshold, the PRO must submit a corrective action plan. These corrective actions are then monitored by HCFA, and subsequent SuperPRO findings are closely examined to monitor a PRO's

performance. We routinely analyze those areas where the disagreement rate exceeds the threshold and require the PRO to take additional corrective action, if necessary. Additionally, the PRO's performance in this activity is considered in the PRO evaluation process.

SuperPRO and PROMPTS are essential parts of the PRO evaluation process and are used to carefully monitor and evaluate the validity, reliability, and efficiency of PRO application of quality screens. HCFA agrees with ProPAC's recommendation that the Secretary should continue to develop, test, and implement more sophisticated methods of inpatient and outpatient quality review.

Additionally, we are developing methodology for the PROs to use in proposing pilot projects in each of these areas. For example, we will be looking at proposals under which the PROs would review the quality of care in physicians' offices and in other outpatient settings. The pilot studies would be designed to track the patient across all settings in which care is received to assess health longitudinally. We also will be planning pilot projects under which PRO review will be lessened in hospitals whose performance appears superior, as judged by such things as consistently lower than expected risk-adjusted mortality and rehospitalization rates. This will help us to determine whether patient outcomes in these hospitals differ significantly from those where the normal PRO review process is in place.

Comment: One commenter disagreed with our assertion that our existing PRO review activities are sufficient. The commenter noted that these activities represent simply administrative tools used in the administration of the program and that it is time to undertake a thorough, independent review of the impact of PROs on quality of care for Medicare beneficiaries.

Response: We do not agree that all of the activities we cited are mere evaluative tools and, thus, simply administrative mechanisms used in the proper and efficient administration of the program. We are, however, about to begin a demonstration to review services furnished by physicians in various settings (ranging from inpatient hospital services to those furnished in physicians' offices). This review, which will include reviews of beneficiaries who have been hospitalized, will enable us to discern the outcomes experienced by beneficiaries.

In addition, we have begun a project, which collects abstracted clinical data, to detect deteriorations or improvements

in the medical treatment of Medicare beneficiaries. These may be measured by changes from year to year in the incidence of interventions such as hospitalization or by diagnostic or therapeutic interventions in the ambulatory setting and in the outcomes of such interventions as measured by mortality, morbidity, disability, and expenditures. To establish a baseline measure of health and functional status, we are considering developing a registry that will contain assessments of the condition of the Medicare beneficiary at the time of entry and at appropriate intervals thereafter. Such information will permit more effective evaluation of trends by taking into account the variations in the initial condition of the beneficiary.

The data generated from these and other pilot projects will allow us to refine goals and objectives for the program based upon outcome measurements. While this also could be considered part of good program administration, we view it as an assessment of the program's overall impact. Any other measurement activity would require baseline comparative data, which are not currently available.

C. Ambulatory Surgery Payment

1. Medicare Payment for Hospital Outpatient Surgery (Recommendation 16)

Recommendation: Beginning in FY 1990, Medicare payment for the facility component of hospital outpatient surgery including capital should be entirely prospective. Separate rates should be established for each of the six groups proposed for payment of services furnished in ambulatory surgery centers (ASCs). The rate for FY 1990 should be based on a blend of hospital-specific costs, average hospital costs, and the rate paid to freestanding ASCs. The rate should be updated annually.

The level of the prospective rates should be the same in FY 1990 as they would have been under current policy. Payments should be adjusted to reflect differences in area wages. These changes in hospital outpatient surgery payment policy should apply to the list of ASC-approved procedures only; other Medicare payment provisions should continue for all other procedures. ProPAC does not recommend special treatment of eye and ear specialty hospitals.

Response in the Proposed Rule: We agree with ProPAC's objective to develop a prospective payment system for hospital outpatient ambulatory surgical services. However, we do not

agree with the approach ProPAC has recommended. As we stated in our interim report to Congress last year on this subject, a prospective payment system for hospital outpatient ambulatory surgical services should be based on two basic principles. First, Medicare program outlays should be no greater under a hospital outpatient prospective payment system than under the current system. Second, the prospective payment system should create a level playing field between ASC and hospital outpatient departments; that is, any difference between hospital-based payments and ASC payments should be based on justifiable differences in cost.

We plan to continue studying different approaches to incorporate hospital outpatient surgical services into a prospective payment system that is based on the principles stated above. Thus, we recommend no further changes to the hospital outpatient ambulatory surgical payment system at this time.

Comment: We received one comment, which was from ProPAC. While ProPAC basically agrees with the premise of our response in the proposed rule, it continues to recommend an interim prospective payment system for hospital outpatient surgeries. In addition, ProPAC recommended an investigation of ways to improve data from ASCs.

Response: We continue to believe we should not support any changes in Medicare payment policy for hospital outpatient surgical procedures at this time. Instead, we will continue in our efforts to develop a fully prospective payment system for all hospital outpatient services as mandated by section 1135(d) of the Act, as enacted by section 9343(f) of Pub. L. 99-509.

ProPAC's comment stated that ProPAC agreed with us that an outpatient prospective payment system should recognize justifiable differences in costs of furnishing services between hospital outpatient departments and ASCs. However, while ProPAC identified several factors that would account for the cost difference, ProPAC stated that the effect on costs is not understood and proposed that the interim system give "less prominence" to the freestanding ASC rates in establishing the outpatient rates. In this regard, since Congress mandated that any such differences in costs between ASCs and hospital outpatient departments be taken into account in establishing a prospective system (section 1135(d) of the Act), we do not believe a prospective payment system should be implemented. In addition, ProPAC's concern regarding data constraints with respect to ASC rates

further justifies our position to make no changes at the present time.

Our recommendation is based on the fact that we do not have sufficient data at this time to assess the impact the proposed changes would have on beneficiaries, hospitals, and the Medicare program. We are only just beginning to receive the first cost reports reflecting the current payment system for ambulatory surgical procedures in hospitals. In addition, various studies are now being conducted that should provide valuable data when completed. We believe a move from the current system to a new system on a temporary basis would be very disruptive to the industry, and implementing the system would place a significant strain on our current resources, particularly in such a short period of time as the ProPAC's proposal would require. Therefore, we continue to recommend no further changes at this time.

2. Beneficiary Liability for Hospital Outpatient Surgery (Recommendation 17)

Recommendation: The Secretary should modify the methodology used to determine Medicare Part B coinsurance for certain ambulatory surgery services performed in hospital outpatient departments. Currently, beneficiary coinsurance is based on hospital submitted charges. ProPAC believes that beneficiary coinsurance should be limited to 20 percent of the payment amount allowed by Medicare. The Medicare program should bear the costs of the change.

Response in the Proposed Rule: As was stated in our response to Recommendation 16, we oppose making any changes to the present payment system for ambulatory surgical services. Therefore, we would be unable to implement this ProPAC recommendation for the present time.

In addition, the present system pays in the aggregate for surgery performed in a hospital outpatient setting based on the lesser of cost or charges or a blend of a hospital-specific amount and the ASC payment amount. Because the system is based on payments in the aggregate, calculated upon retroactive settlement, it is not possible to determine the actual payment amount based on individual bills, as would be necessary to implement ProPAC's proposal. Therefore, we believe that no changes should be made at this time.

Comment: In its comments on the proposed rule, ProPAC reiterated its position that the Medicare program should assume responsibility for 80 percent of the payment amount. ProPAC

recommended that the method for calculating part B coinsurance for hospital outpatient surgery be modified.

Response: As we stated above, we recommend no change to the present payment system. This being the case, ProPAC's recommendation, which is based on a fully prospective payment system, would not apply under the present system. Under the present system, Medicare payment is not determined on an individual beneficiary basis but is made in the aggregate for all ASC beneficiary services furnished during the cost reporting period. Therefore, we will give this recommendation consideration after a prospective payment system for all outpatient services is in place.

VI. Other Required Information

A. Effective Dates

The effective date of this final rule (including the addendum and appendixes) is October 1, 1989. However, the changes we are making to § 412.116 concerning special interim payments to hospitals not receiving PIP for unusually long lengths of stay are effective on September 1, 1989.

B. Waiver of 30-Day Delay in the Effective Date

We ordinarily provide for a 30-day delay in the effective date of a substantive final rule. However, if adherence to this procedure would be impractical, unnecessary, or contrary to public interest, we may waive the delay in the effective date. As discussed in detail in section IV.I. of this preamble, on January 21, 1988, we published a final rule with comment period that set forth, in part, the circumstances under which a prospective payment hospital could receive PIP payments for the services it furnishes. That rule implemented the provisions of section 9311(a) of Pub. L. 99-509, which effectively invalidated an August 15, 1986 final rule in which we had eliminated PIP for all hospitals except small rural hospitals.

Although the August 15, 1986 final rule had provided for a special interim payment to prospective payment hospitals not receiving PIP for unusually long stays, we did not make that same provision in the January 21, 1988 final rule. However, in this final rule, after consideration of the comments we received in response to the January 21, 1988 final rule concerning the special interim payment and because of the elimination of a day limitation on hospital inpatient services by section 101(b) of Pub. L. 100-360, we have decided to restore the special interim

payment to prospective payment hospitals not receiving PIP.

We have made this change effective on September 1, 1989, for all current qualifying inpatient hospital admissions. If we were to provide a 30-day delay in the effective date of these changes, hospitals experiencing these unusually long stays would be required to wait another 30 days before requesting a special interim payment and thus be deprived of the benefits of this change. Thus, a 30-day delay in effective date would be contrary to public interest. For these reasons, we find good cause to waive the normal 30-day delay in effective date for the changes made to § 412.116.

C. Paperwork Reduction Act

This final rule does not impose information collection requirements. Consequently, it need not be reviewed by the Office of Management and Budget under the authority of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501-3511).

D. List of Subjects in 42 CFR Part 412

Health facilities, Medicare.

42 CFR part 412 is amended as set forth below:

Chapter IV—Health Care Financing Administration, Department of Health and Human Services

Subchapter B—Medicare Programs

PART 412—PROSPECTIVE PAYMENT SYSTEM FOR INPATIENT HOSPITAL SERVICES

A. The authority citation for part 412 continues to read as follows:

Authority: Secs. 1102, 1122, 1815(e), 1871, and 1886 of the Social Security Act (42 U.S.C. 1302, 1320a-1, 1395g(e), 1395hh, and 1395ww).

Subpart A—General Provisions

B. Subpart A is amended as follows:

§ 412.8 [Amended]

In § 412.8, paragraph (b)(4) is removed.

Subpart F—Payment for Outliers

C. Subpart F is amended as follows:

§ 412.84 [Amended]

In § 412.84(k), the phrase "and before October 1, 1989" is removed, and the cross reference to "paragraph (i)" is revised to read "paragraph (j)."

Subpart G—Special Treatment of Certain Facilities

D. Subpart G is amended as follows:

1. In § 412.92, the introductory text of paragraph (a) is republished; in

paragraph (a)(1), the introductory text of paragraph (a)(2), and paragraph (a)(2)(i), the number "50" is revised to read "35"; paragraph (a)(3) is revised; in paragraph (b)(1)(ii)(B), the number "50" is revised to read "35"; paragraph (b)(4)(iii) is revised; in the introductory text of paragraph (e)(3) and paragraph (e)(3)(i), the term "HCFA" is revised to read "the intermediary"; paragraph (e)(3)(ii) is revised; in paragraph (e)(3)(iii), the term "HCFA" is revised to read "the intermediary"; and, in paragraph (g)(6), the phrase, "beginning before October 1, 1989" is removed. The changes read as follows:

§ 412.92 Special treatment: Sole community hospitals.

(a) *Criteria for classification as a sole community hospital.* HCFA classifies a hospital as a sole community hospital if it is located in a rural area (as defined in § 412.62(f)), and meets one of the following conditions: * * *

(3) The hospital is located between 15 and 25 miles from other like hospitals but because of local topography or periods of prolonged severe weather conditions, the other like hospitals are inaccessible for at least 30 days in each 2 out of 3 years.

(b) *Classification procedures.* * * *

(4) *Cancellation of classification.* * * *

(iii) If a hospital requests that its sole community hospital classification be cancelled, it may not be reclassified as a sole community hospital unless it meets the following conditions:

(A) At least one full year has passed since the effective date of its cancellation.

(B) The hospital meets the qualifying criteria set forth in paragraph (a) of this section in effect at the time it reapplies.

(e) *Additional payments to sole community hospitals experiencing a significant volume decrease.* * * *

(3) * * *
(ii) The intermediary makes its determination within 180 days from the date it receives the hospital's request and all other necessary information.

2. In § 412.94, paragraph (b)(1) is revised and a new paragraph (b)(4) is added to read as follows:

§ 412.94 Special treatment: Cancer hospitals.

(b) *Payment.* (1) A hospital meeting the criteria in paragraph (a) of this section may elect, during its first cost reporting period subject to the

prospective payment system, to be paid on a reasonable cost basis under part 413 of this chapter (and under other regulations governing reasonable cost in subparts D and E of part 405 of this chapter), and subject to the rate of increase limit under § 413.40 of this chapter.

(4) A hospital that elects reasonable cost reimbursement is otherwise subject to the prospective payment system with respect to hospital inpatient services, as provided in § 412.20. The provisions in §§ 412.113 and 412.116 concerning payment for capital-related costs and method of payment for inpatient hospital services, respectively, are applicable to such a hospital.

3. In § 412.96, paragraph (f) is revised to read as follows:

§ 412.96 Special treatment: Referral centers.

(f) *HCFA review of referral center status.*—(1) *General rule.* The status of each hospital that is receiving a referral center adjustment is reviewed by the HCFA regional office every 3 years to determine if the hospital continues to meet the applicable criteria.

(2) *Retention criteria.* To retain referral center status, a hospital must meet the applicable criteria—

(i) In at least 2 of the last 3 years; or
(ii) For the current year.

(3) *Cancellation of referral center status.* If a hospital does not meet either of the retention criterion in paragraph (f)(2) of this section and no longer qualifies for a referral center adjustment, HCFA discontinues the adjustment beginning on the first day of the hospital's next cost reporting period.

4. Section 412.106 is revised to read as follows:

§ 412.106 Special treatment: Hospitals that serve a disproportionate share of low-income patients.

(a) *General considerations.* (1) The factors considered in determining whether a hospital qualifies for a payment adjustment include the number of beds, the number of patient days, and the hospital's location.

(i) The number of beds in a hospital is determined in accordance with § 412.118(b).

(ii) The number of patient days includes only those days attributable to areas of the hospital that are subject to the prospective payment system and excludes all others.

(iii) The hospital's location, in an urban or rural area, is determined in

accordance with the definitions in § 412.62(f).

(2) The payment adjustment is applied to the hospital's total DRG revenues.

(i) A hospital's total DRG revenues are determined on the basis of DRG-adjusted prospective payment rates or, for transition period payments, on the basis of the Federal portion of the hospital's payment rates.

(ii) For purposes of this section, total DRG revenues include outlier payments under Subpart F of this part, but exclude additional payments made under this subpart or under § 412.118 for indirect medical education costs.

(b) *Determination of a hospital's disproportionate patient percentage*—(1) *General rule.*

A hospital's disproportionate patient percentage is determined by adding the results of two computations and expressing that sum as a percentage.

(2) *First computation: Federal fiscal year.* For each month of the Federal fiscal year in which the hospital's cost reporting period begins, HCFA—

(i) Determined the number of covered patient days that—

(A) Are associated with discharges occurring during each month; and

(B) Are furnished to patients who during that month were entitled to both Medicare Part A and SSI, excluding those patients who received only State supplementation;

(ii) Adds the results for the whole period; and

(iii) Divides the number determined under paragraph (b)(2)(ii) of this section by the total number of patient days that—

(A) Are associated with discharges that occur during that period; and

(B) Are furnished to patients entitled to Medicare Part A.

(3) *First computation: Cost reporting period.* If a hospital prefers that HCFA use its cost reporting period instead of the Federal fiscal year, it must furnish its intermediary, in machine-readable format as prescribed by HCFA, data on its Medicare part A patients for its cost reporting period.

(4) *Second computation.* The fiscal intermediary determines, for the hospital's cost reporting period, the number of patient days furnished to patients entitled to Medicaid but not to Medicare part A, and divides that number by the total number of patient days in that same period.

(5) *Disproportionate patient percentage.* The intermediary adds the results of the first computation made under either paragraph (b)(2) or (b)(3) of this section and the second computation made under paragraph (b)(4) of this section and expresses that sum as a

percentage. This is the hospital's disproportionate patient percentage, and is used in paragraph (c) of this section.

(c) *Criteria for classification.* A hospital is classified as a "disproportionate share" hospital under any of the following circumstances:

(1) The hospital's disproportionate patient percentage, as determined under paragraph (b)(5) of this section, is at least equal to one of the following:

(i) 15 percent, if the hospital is located in an urban area and has 100 or more beds, or is located in a rural area and has 500 or more beds.

(ii) 40 percent, if the hospital is located in an urban area and has fewer than 100 beds.

(iii) 45 percent, if the hospital is located in a rural area and has fewer than 500 beds.

(2) The hospital is located in an urban area, has 100 or more beds, and can demonstrate that, during its cost reporting period, more than 30 percent of its net inpatient care revenues are derived from State and local government payments for care furnished to indigent patients.

(d) *Payment adjustment*—(1) *Method of adjustment.* If a hospital serves a disproportionate number of low-income patients, its total DRG revenues are increased by an adjustment factor as specified in paragraph (d)(3) of this section.

(2) *Effective dates for payment adjustment.* Payment adjustment under this section is effective for discharges that occur on or after May 1, 1986 (October 1, 1988 for rural hospitals with 500 or more beds) and before October 1, 1995.

(3) *Payment adjustment factors.* (i) If the hospital meets the criteria of paragraph (c)(1)(i) of this section, the payment adjustment factor is 2.5 percent, plus one-half the difference between the hospital's disproportionate patient percentage and 15 percent.

(ii) If the hospital meets the criteria of paragraph (c)(1)(ii) of this section, the payment adjustment factor is 5 percent

(iii) If the hospital meets the criteria of paragraph (c)(1)(iii) of this section, the payment adjustment factor is 4 percent

(iv) If the hospital meets the criteria of paragraph (c)(2) of this section, the payment adjustment factor is 25 percent.

Subpart H—Payments to Hospitals Under the Prospective Payment System

E. Subpart H is amended as follows:

1. In § 412.116, paragraphs (d) and (e) are redesignated as paragraph (e) and (f), respectively, and a new paragraph (d) is added to read as follows:

§ 412.116 Method of payment.

(d) *Special interim payment for unusually long lengths of stay.*—(1) *First interim payment.* A hospital that is not receiving periodic interim payments under paragraph (b) of this section may request an interim payment after a Medicare beneficiary has been in the hospital at least 60 days. Payment for the interim bill is determined as if the bill were a final discharge bill and includes any outlier payment determined as of the last day for which services have been billed.

(2) *Additional interim payments.* A hospital may request additional interim payments at intervals of at least 60 days after the date of the first interim bill submitted under paragraph (d)(1) of this section. Payment for these additional interim bills, as well as the final bill, is determined as if the bill were the final bill with appropriate adjustments made to the payment amount to reflect any previous interim payment made under the provisions of this paragraph (d).

§ 412.118 [Amended]

2. In § 412.118, in paragraphs (c)(1), (c)(2), (d)(1), and (d)(2), the phrase "October 1, 1990" is revised to read "October 1, 1995".

(Catalog of Federal Domestic Assistance Program No. 13.773, Medicare—Hospital Insurance)

Dated: August 15, 1989.

Louis B. Hays,

Acting Administrator, Health Care Financing Administration.

Approved: August 25, 1989.

Louis W. Sullivan,

Secretary.

Editorial Note: The following addendum and appendixes will not appear in the Code of Federal Regulations.

ADDENDUM—SCHEDULE OF STANDARDIZED AMOUNTS EFFECTIVE WITH DISCHARGES ON OR AFTER OCTOBER 1, 1989 AND UPDATE FACTORS AND TARGET RATE PERCENTAGES EFFECTIVE WITH COST REPORTING PERIODS BEGINNING ON OR AFTER OCTOBER 1, 1989

I. Summary and Background

In this addendum, we are making changes in the amounts and factors for determining prospective payment rates for Medicare inpatient hospital services. We are also setting forth new target rate percentages for determining the rate-of-increase limits (target amounts) for hospitals and hospital units excluded from the prospective payment system.

For hospital cost reporting periods beginning on or after October 1, 1989, except for sole community hospitals and hospitals located in Puerto Rico, each hospital's payment per discharge under the prospective payment system will be comprised of 100 percent of the Federal rate. Except for hospitals affected by the regional floor, the Federal rate is based on 100 percent of the national rate.

Sole community hospitals are to be paid on the basis of a rate per discharge composed of 75 percent of the hospital-specific rate and 25 percent of the applicable Federal regional rate (section 1886(d)(5)(C)(ii) of the Act). Hospitals in Puerto Rico are paid on the basis of a rate per discharge composed of 75 percent of a Puerto Rico rate and 25 percent of a national rate (section 1886(d)(5)(A) of the Act). Hospitals affected by the regional floor are paid on the basis of 85 percent of the Federal national rate and 15 percent of the Federal regional rate.

As discussed below in section II, we are making changes in the determination of the prospective payment rates. The changes, to be applied prospectively, will affect the calculation of the Federal rates. Section III sets forth our changes for determining the rate-of-increase limits for hospitals excluded from the prospective payment system. The tables to which we refer in the preamble to the final rule are presented at the end of this addendum in section IV.

II. Changes to Prospective Payment Rates for Hospitals for FY 1990

The basic methodology for determining prospective payment rates is set forth at § 412.63 for hospitals located outside of Puerto Rico. The basic methodology for determining the prospective payment rates for hospitals located in Puerto Rico is set forth at §§ 412.210 and 412.212. Below we discuss the manner in which we are changing some of the factors used for determining the prospective payment rates. The Federal and Puerto Rico rate changes, once issued as final, will be effective with discharges occurring on or after October 1, 1989. As required by section 1886(d)(4)(C) of the Act, we must adjust the DRG classifications and weighting factors for discharges in FY 1990.

In summary, the standardized amounts set forth in Tables 1a, 1b, and 1c of section IV of this addendum were—

- Adjusted to ensure budget neutrality as provided in section 1886(d)(8)(D) of the Act;
- Adjusted by the revised urban and rural outlier offsets; and

- Updated by 5.5 percent (that is, the market basket percentage increase).

A. Calculation of Adjusted Standardized Amounts

1. Standardization of Base-Year Costs or Target Amounts

Section 1886(d)(2)(A) of the Act required the establishment of base-year cost data containing allowable operating costs per discharge of inpatient hospital services for each hospital. The preamble to the interim final rule, published September 1, 1983 (48 FR 39763), contains a detailed explanation of how base-year cost data were established in the initial development of standard amounts for the prospective payment system and how they are used in computing the Federal rates.

Section 1886(d)(9)(B)(i) of the Act required that Medicare target amounts be determined for each hospital located in Puerto Rico for its cost reporting period beginning in FY 1987. The September 1, 1987 final rule contains a detailed explanation of how the target amounts were determined and how they are used in computing the Puerto Rico rates (52 FR 33043, 33066).

The standardized amounts are based on per discharge averages of adjusted hospital costs or, for Puerto Rico, adjusted target amounts, from a base period, updated and otherwise adjusted in accordance with the provisions of section 1886(d) of the Act. Sections 1886(d)(2)(C) and (d)(9)(B)(ii) of the Act required that the updated base-year per discharge costs and, for Puerto Rico, the updated target amounts, respectively, be standardized in order to remove from the cost data the effects of certain sources of variation in cost among hospitals. These include case mix, differences in area wage levels, cost of living adjustments for Alaska and Hawaii, indirect medical education costs, and payments to hospitals serving a disproportionate share of low-income patients.

Since all adjustments for variation in hospital operating costs or target amounts have already been accounted for consistent with the construction of the standardized amounts, no revision was made at the hospital level for those factors. That is, the adjustments for differences in case mix, wages, cost-of-living, indirect medical education costs, and payments to hospitals serving a disproportionate share of low-income patients reflected in the FY 1990 standardized amounts are identical to those reflected in the current (FY 1989) standardized amounts.

2. Computing Urban and Rural Averages Within Geographic Areas

In determining the prospective payment rates for FY 1984, section 1886(d)(2)(D) of the Act required that the average standardized amounts be determined for hospitals located in urban and rural areas of the nine census divisions and the nation. Under section 1886(d)(9)(B)(iii) of the Act, the average standardized amount per discharge for FY 1988 must be determined for hospitals located in urban and rural areas in Puerto Rico.

For FY 1990, except for hospitals in Puerto Rico and those hospitals that are affected by the regional floor, the Federal rates will be comprised of 100 percent of the national rate (section 1886(d)(1)(A)(iii) of the Act). The Federal rate for hospitals affected by the regional floor is based on 85 percent of the national rate and 15 percent of the regional rate. Section 1886(d)(5)(C)(ii) of the Act specifies that a sole community hospital's Federal rate is based on 100 percent of the regional rate. Hospitals in Puerto Rico are paid a blend of 75 percent of the applicable Puerto Rico standardized amount and 25 percent of a national standardized payment amount.

Section 4002(c)(1) of the Omnibus Budget Reconciliation Act of 1987 (Pub. L. 100-203) amended section 1886(d)(3) of the Act to require the Secretary to compute three average standardized amounts for discharges occurring in a fiscal year beginning on or after October 1, 1987: one for hospitals located in rural areas; one for hospitals located in large urban areas; and one for hospitals located in other urban areas. Section 4002(b) of Pub. L. 100-203 amended section 1886(d)(2)(D) of the Act to define a "large urban area" as an urban area with a population of more than 1,000,000. In addition, section 4009(i) of Pub. L. 100-203 provides that a New England County Metropolitan Area (NECMA) with a population of more than 970,000 is classified as a large urban area. As required by section 1886(d)(2)(D) of the Act, population size is determined by the Secretary based on the latest population data published by the Bureau of the Census. Under that section as now amended, urban areas that do not meet the definition of a "large urban area" are referred to as "other urban areas."

Based on 1987 population estimates published by the Bureau of the Census, the current 46 large urban areas continue to meet the criteria to be defined as large urban areas for FY 1990. A list of those areas was set forth in a

notice published on April 5, 1988 at 53 FR 11138. In addition, these areas are identified by an asterisk in Tables 4a and 4c as set forth in section IV of this addendum. No additional areas were identified. Therefore, we are making no change in these areas for purposes of this final rule.

Table 1a contains the three national standardized amounts that would be applicable to most hospitals. Table 1b sets forth the 27 regional standardized amounts that would be applicable to sole community hospitals and to hospitals subject to the regional floor. Under section 1886(d)(9)(A)(ii) of the Act, the national standardized payment amount applicable to hospitals in Puerto Rico consists of the discharge-weighted average of the national rural standardized amount, the national large urban standardized amount, and the national other urban standardized amount (as set forth in Table 1a). The national average standardized amount for Puerto Rico is set forth in Table 1c. This table also includes the three standardized amounts that would be applicable to most hospitals in Puerto Rico.

The methodology for computing the national average standardized amounts is identical to the methodology for determining the regional amounts.

We stated in the addendum to the proposed rule that the Office of Management and Budget (OMB) may announce revised listings of the Metropolitan Statistical Area (MSA) and NECMA designations that are used in calculating the standardized amounts. We noted that if OMB makes the announcement before we issue the final rule, we would list the revised MSA/NECMA designations in the addendum to the final rule. Consistent with Medicare policy and our regulations at § 412.63(b)(4), any changes in designation are effective for discharges occurring on or after October 1, 1989.

Since publication of the proposed rule, OMB has announced a new MSA, Jamestown-Dunkirk, NY, which comprises the county of Chataqua and has Jamestown and Dunkirk as its central cities. We have incorporated this change in the final wage index set forth in Tables 4a, 4b, and 4c in the addendum to this final rule.

3. Updating the Average Standardized Amounts

In accordance with section 1886(d)(3)(A) of the Act, we are updating the large urban, other urban, and rural average standardized amounts and the hospital-specific rate (which applies only to sole community hospitals) using the applicable percentage increase

specified in section 1886(b)(3)(B)(i) of the Act. The percentage increase to be applied is mandated under that section of the law as the estimated percentage increase in the hospital market basket for hospitals located in all areas. The percentage change in the market basket reflects the average change in the price of goods and services purchased by hospitals to furnish inpatient care. The most recent forecasted hospital market basket increase and, thus, the applicable percentage increase for FY 1990 is 5.5 percent.

The 5.8 percent market basket rate of increase set forth in the proposed rule was based on the February 1989 hospital input price forecasts. However, the August 1989 forecasts indicate a decline in the projected FY 1990 hospital market basket index for the February forecasts. The components of the market basket in which the most significant changes have occurred between the two forecasts include pharmaceuticals, which increased by 0.1 percent, and malpractice insurance, which decreased by 0.3 percent. We note that the decrease in the malpractice insurance forecast occurred because the hospital insurance industry is experiencing a deceleration in malpractice insurance premium increases. Malpractice insurance premiums are now forecasted to increase at a lower rate (three to four percent) than in the February forecast. We also note that the forecast for the main component of the hospital market basket, wages and salaries, remained essentially unchanged from the previous forecast.

Although the update factor for FY 1990 is set by law, we were required by section 1886(e)(3)(B) of the Act to report to Congress no later than March 1, 1989 on our initial recommendation of update factors for FY 1990 for both prospective payment hospitals and hospitals excluded from the prospective payment system. For general information purposes, we published this report as appendix B of the proposed rule. Our final recommendation on the update factors (which is required by sections 1886(e)(4) and (e)(5)(A) of the Act) is set forth as appendix B of this final rule.

Comment: One commenter stated that the hospital market basket does not accurately reflect the true economic expenses incurred by hospitals since nonhospital wages are included in the labor component of the market basket.

Response: The rebased hospital market basket was established in FY 1987, and we have not proposed any changes to the market basket forecasting methodology for FY 1990. The methodology we used to forecast the market basket inflation for FY 1990

is consistent with that outlined in the September 3, 1986 final rule (51 FR 31461). We do not believe it is appropriate to make changes to specific market basket components without also examining all of the other components of the market basket. While changing the proxy measures used in the wage component of the market basket may result in a higher inflation forecast for that component, it is also possible that further analysis of the appropriateness of the forecasting measures used in the other components of the market basket could result in lower forecasts being developed. Therefore, we do not believe it is appropriate to adopt changes to various components of the market basket and that any revisions should be made only in conjunction with a complete rebasing of the market basket. Absent rebasing, we believe it is important that the model we use in developing the market basket forecasts be carried forward over a period of years so that forecasts will be consistent from year to year.

We agree that the issue of appropriate wage proxies warrants further consideration. We are planning to include a rebased hospital market basket as a part of the proposed rule concerning changes in the inpatient hospital prospective payment system for FY 1991. We will consider options for revising the market basket components as part of that process.

4. Other Adjustments to the Average Standardized Amounts

a. Indirect Medical Education. Section 1886(d)(3)(C)(ii) of the Act provides that, effective for discharges occurring on or after October 1, 1986, the average standardized amounts be further reduced, taking into consideration the effects of the standardization for indirect medical education costs as described in section II.A.1. of this addendum. The required adjustment is to ensure that the program savings that would be achieved through standardizing for indirect medical education on one basis and computing indirect medical education payments on another basis are preserved.

The first such adjustment was implemented for the standardized amounts effective October 1, 1986. (See the September 3, 1986 final rule (51 FR 31521).) Since section 1886(d)(3)(C)(ii) of the Act, as amended by section 4003(a)(2) of Pub. L. 100-203, required a revision of the adjustment due to the reduction of the adjustment factor for computing indirect medical education payments effective October 1, 1988, we made a further adjustment to the

standardized amounts effective October 1, 1988 to achieve the incremental savings that resulted from that reduction in indirect medical education payments. See the September 30, 1988 final rule (53 FR 38539) for the factors used to make this adjustment. Since there has been no change in the indirect medical education factor for FY 1990, we are not proposing to make any further adjustment to the standardized amounts for FY 1990.

b. Rural Hospitals Deemed to be Urban. Section 1886(d)(8)(B) of the Act provides that certain rural hospitals are deemed urban effective with discharges occurring on or after October 1, 1988. Section 1886(d)(8)(C) of the Act, as added by section 8403(a) of the Technical and Miscellaneous Revenue Act of 1988 (Pub. L. 100-647), specifies that if the wage index values applicable to MSAs that are now deemed to include certain rural hospitals and to the rural areas in which those hospitals are actually located were reduced because of the provisions of section 1886(d)(8)(B) of the Act, those wage index values must be recalculated as if that section had not been enacted. A separate wage index value is calculated for each of the affected counties (that is, those rural counties whose hospitals are deemed urban).

Section 1886(d)(8)(D) of the Act specifies two payment conditions that must be met. First, the FY 1990 urban standardized amounts are to be adjusted so as to ensure that total aggregate payments under the prospective payment system after implementation of the provisions of sections 1886(d)(8)(B) and (C) of the Act are equal to the aggregate prospective payments that would have been made absent these provisions. That is, the additional payments to those rural hospitals that have been deemed urban must be financed through a reduction in the urban standardized amounts. Second, the rural standardized amounts are to be adjusted to ensure that aggregate payments to rural hospitals not affected by these provisions neither increase nor decrease as a result of implementation of these provisions. That is, aggregate payments to those rural hospitals that have not been deemed urban should not change as a result of these provisions. The following budget neutrality adjustment factors were applied to the proposed standardized amounts: Urban—.99943; Rural—1.00030.

After further analysis of the effect of payments to rural hospitals as a result of the implementation of section 1886(d)(8)(C) of the Act, we noted inaccuracies in our computation of the

proposed budget neutrality adjustment applicable to rural hospitals.

The provisions of section 1886(d)(8)(C) of the Act essentially restore the wage index values for those rural areas negatively impacted by the redesignation of certain rural hospitals previously included in the computation of those areas' rural wage index values. Thus, with implementation of this section, there is no effect on aggregate payments to those rural hospitals. However, hospitals in rural areas that experienced increases in their wage index values when the affected counties were redesignated under section 1886(d)(8)(B) of the Act are allowed to retain those higher values. The net effect of the enactment of sections 1886(d)(8)(B) and (C) of the Act is to increase aggregate payments to rural hospitals over those prior to implementation of these provisions. Therefore, in order to achieve budget neutrality, a decrease in the rural rates would be required to offset the additional payments to rural hospitals whose wage index values have increased. Through an oversight in the methodology used in developing the proposed budget neutrality factor, the rural rates were not adjusted to meet this requirement.

In addition, we incorrectly included rural referral centers not located in redesignated counties with rural hospitals. Since rural referral centers are paid the other urban rate, their payments were reduced by the budget neutrality factor applied to the urban rates. In effect, the methodology we used to calculate the proposed budget neutrality factor applicable to the rural rates would have compensated other rural hospitals for a reduction in payments that they will not incur. Therefore, rural referral centers not located in redesignated counties have been included with urban hospitals for the purpose of the budget neutrality computation. This methodological change has a negligible effect on rural referral centers.

The following adjustment factors were applied to the final standardized amounts: Urban—.99940; Rural—.99925.

c. Outliers. Section 1886(d)(5)(A) of the Act requires that, in addition to the basic prospective payment rates, payments must be made for discharges involving day outliers and may be made for cost outliers. Section 1886(d)(3)(B) of the Act correspondingly requires that the urban and rural standardized amounts, respectively, be separately reduced by the proportion of estimated total DRG payments attributable to estimated outlier payments for hospitals

located in urban areas and those located in rural areas. Section 1886(d)(9)(B)(iv) of the Act requires that the urban and rural standardized amounts be reduced by the proportion of estimated total payments made to hospitals in Puerto Rico attributable to estimated outlier payments.

Consequently, instead of a uniform reduction factor applying equally to all the standardized amounts, there are two separate reduction factors, one applicable to the urban national and regional standardized amounts and the other applicable to the rural national and regional standardized amounts. Furthermore, sections 1886(d)(5)(A)(iv) and 1886(d)(9)(i) of the Act direct that outlier payments may not be less than five percent nor more than six percent of total payments projected to be made based on the prospective payment rates in any year.

In the September 30, 1988 final rule, we set the outlier thresholds so as to result in estimated outlier payments (prior to consideration of the additional covered days that will result from the elimination of a day limitation on Medicare inpatient hospital services under section 101 of the Medicare Catastrophic Coverage Act of 1988 (Pub. L. 100-360)) equal to 5.1 percent of total prospective payments. We also set the same outlier thresholds and offsets for the Puerto Rico prospective payment standardized amounts as we had for hospitals located outside Puerto Rico. Because certain changes we made to the outlier policy were not effective until November 1, 1988, we had two sets of outlier thresholds for FY 1989. For discharges on or after October 1, 1988 and before November 1, 1988, the day outlier threshold is the geometric mean length of stay for each DRG plus the lesser of 22 days or 2.0 standard deviations and the cost outlier threshold is the greater of 2.0 times the prospective payment rate for the DRG or \$23,750. For discharges on or after November 1, 1988, the day outlier threshold is the geometric mean length of stay for each DRG plus the lesser of 24 days or 3.0 standard deviations and the cost outlier threshold is the greater of 2.0 times the prospective payment rate for the DRG or \$28,000. The outlier adjustments for FY 1989 were .9437 for the urban rates and .9777 for the rural rates.

We proposed to continue to set the outlier thresholds so as to result in estimated outlier payments equal to 5.1 percent of total prospective payments. Therefore, for FY 1990, we proposed to set the day outlier threshold at the geometric mean length of stay for each

DRG plus the lesser of 27 days or 3.0 standard deviations and the cost outlier threshold at the greater of 2.0 times the prospective payment rate for the DRG or \$32,000.

The proposed outlier adjustment factors for FY 1990 were as follows: Urban—.943686; Rural—.977958.

In this final rule, we have continued to set the outlier thresholds so as to result in estimated outlier payments equal to 5.1 percent of total prospective payments. Therefore, for FY 1990, the day outlier threshold is the geometric mean length of stay for each DRG plus the lesser of 28 days or 3.0 standard deviations and the cost outlier threshold at the greater of 2.0 times the prospective payment rate for the DRG or \$34,000.

The final outlier adjustment factors for FY 1990 are as follows: Outlier Reduction Factors—Urban—.9436; Rural—.9782.

The 5.1 percent projection of outlier payments is based on covered days in the FY 1988 MEDPAR file and does not reflect the increase in outlier payments that will occur in FY 1990 as a result of the elimination of the day limitation on Medicare inpatient hospital services under section 101 of Pub. L. 100-360. Based on FY 1988 data currently available regarding noncovered days of hospital care furnished to Medicare beneficiaries under the benefit structure in effect prior to the effective date of Pub. L. 100-360, we estimate that outlier payment for the additional days of covered care will be about 1.3 percent of total DRG payments. By making an average 5.1 percent offset to the standardized amount in 1990 instead of the 6.4 percent that will actually be paid, we are ensuring that the additional benefits from Pub. L. 100-360 are financed out of additional Federal monies rather than through the updated standardized amounts and outlier funds. For a more detailed explanation of this adjustment made to account for the effect of section 101 of Pub. L. 100-360, see the September 30, 1988 final rule (53 FR 38519). In that rule, we requested comments on the methodology we were using to take the effects of section 101 of Pub. L. 100-360 into account. We are developing a final rule to respond to the comments received from the public; however, we are using the same methodology in FY 1990 as was used to make the adjustment in FY 1989.

Table 8 of section IV of this addendum updates the Statewide average cost-to-charge ratios for urban hospitals and for rural hospitals to be used in calculating cost outlier payments for those hospitals for which the intermediary is unable to compute a

reasonable hospital-specific cost-to-charge ratio. Effective October 1, 1989, these Statewide average ratios replace the ratios published in the September 30, 1988 final rule (53 FR 38628). These average ratios will be used to calculate cost outlier payments for those hospitals for which the intermediary computes cost-to-charge ratios lower than 0.36 or greater than 1.23. This range represents 3.0 standard deviations (plus or minus) from the mean of the log distribution of cost-to-charge ratios for all hospitals. These revised parameters will be applied to all updates to hospital-specific cost-to-charge ratios based on cost report settlements occurring during FY 1990.

Comment: Several commenters objected to the current outlier thresholds and the split between cases paid using the cost outlier methodology and cases paid using the day outlier methodology. One commenter urged that we alter our outlier policy to favor cost outliers. Another commenter suggested that we favor day outliers.

Response: As we noted in the September 30, 1988 final rule (53 FR 38504), the 60 percent cost and 40 percent day outlier split results from the methodology used to pay the outlier cases and not on the threshold criteria. The percentage of payments for day outliers under the current outlier policy has increased relative to those under the policy in effect prior to FY 1989 since high cost day outlier cases are now paid using the cost outlier methodology. Further, we believe that the current outlier policy is still relatively new (it was implemented on November 1, 1988), and that more data are needed to analyze its impact. We will analyze these data as we receive them and reexamine our outlier policy if any adverse effects are detected.

The outlier thresholds essentially maintain the current outlier payment split with 34 percent of cases being paid using the cost outlier methodology and 66 percent using the day outlier methodology. We note that 14 percent of total outlier cases would meet the day outlier threshold but would be paid using the cost outlier methodology because it yields the higher payment. Our simulation of FY 1990 outlier payments based on FY 1988 Medicare provider analysis and review file (MEDPAR) data indicates that the percentage of cases that qualify as day outliers is about 80 percent.

The cases qualifying as day outliers are expected to receive 84 percent of outlier payments in FY 1990. An estimated 20 percent of outlier cases would be cost-only outlier cases, which are expected to receive about 16 percent

of outlier payments. The following table illustrates this finding in greater detail:

Type of outlier	Percent- age of outlier cases	Percent- age of outlier payments
Meets day threshold only.....	56	28.3
Meets day and cost thresh- olds, paid using day methodology.....	10	17.9
Meets day and cost thresh- olds, paid using day methodology.....	14	37.8
Subtotal—All cases meeting day threshold.....	80	84
Meets cost threshold only.....	20	16
Total.....	100	100

Comment: Several commenters suggested that the size of the outlier payment pool be increased from 5.1 percent to the legal maximum of 6 percent so that the outlier thresholds could be lowered. Other commenters wanted to maintain the 5.1 percent pool. Still other commenters, while in favor of an increase in the outlier pool, suggested that it be done with no corresponding additional offsets to the prospective payment rates.

Response: Increasing the size of the outlier pool to six percent in order to reduce the outlier thresholds would increase the number of outlier cases, but it would also proportionately reduce the basic payment for all cases. In addition, as we have noted in previous prospective payment rules (most recently at 53 FR 38505; September 30, 1988), our research indicates that increasing the outlier pool to six percent would cause only a marginal decrease in the risk faced by hospitals under the prospective payment system. We continue to believe that it is desirable at this time to maintain a smaller outlier pool than the maximum six percent because it allows proportionately greater payment for typical cases.

If we were to increase the outlier pool from 5.1 percent to 6 percent without making a corresponding adjustment to the payment rates, we would be adding program funds to the prospective payment system above and beyond the update factor and, in doing so, would violate the restriction that outlier thresholds be set so as to ensure equality between outlier offsets and projected outlier payment, as required under the current law. Section 1886(d)(3)(B) of the Act mandates that outlier payments be financed out of the total payments made under the prospective payment system. Therefore, any increase in the amount of outlier payments will necessarily reduce funds available for typical cases.

Comment: A few commenters suggested that in fiscal years in which outlier payments have fallen short of the outlier reserve, these undisbursed funds should be paid to the hospitals.

Response: We have responded to similar comments in the September 3, 1986 final rule (52 FR 31525), the September 1, 1987 final rule (52 FR 33048), and the September 30, 1988 final rule (53 FR 38508). We are required by section 1886(d)(5)(A) of the Act to estimate, using the most recent data available, what the level of the outlier thresholds should be in order to yield the proper total amount of outlier payments. We believe we have consistently met our statutory obligation to ensure that the rate offsets used to finance outlier payments were equal to the estimated proportion of total prospective payments for outliers. We have used the most recent Medicare discharge data available to estimate total prospective payments and outlier payments as a percentage thereof. This is necessarily a prospective process and the resulting estimate may be inaccurate based on later data. We do not believe that payment or recoupment of outlier monies based on retrospective adjustments to the thresholds would be appropriate.

Although we overestimated the outlier pool in the first years of the prospective payment system and thus underestimated outlier payments, this has not been the case for the last few years. Based on the most recent billing data, we estimate that in FY 1988 outlier payments represented 6.7 percent of total prospective payment system payments which is 1.7 percent higher than the 5.0 percent outlier pool established for that year. We believe this discrepancy between outlier payments and the outlier pool resulted from the fact that the outlier thresholds established for FY 1988 assumed a 2.7 percent update to the prospective payment rates. However, this update was in effect for only 132 days of FY 1988 and was subsequently revised by the provisions of sections 4002 of Pub. L. 100-203. For FY 1989, we estimate that outlier payments will represent approximately 5.9 percent of total prospective payment system payments and will exceed the outlier pool of 5.1 percent by about 0.8 percent. If we were to make retroactive adjustments for incorrect outlier pool estimates as the commenters suggested, we would now be making reductions in prospective payments.

B. Adjustments for Area Wage Levels and Cost-of-Living

This section contains an explanation of the application of two types of adjustments to the adjusted standardized amounts that will be made by the intermediaries in determining the prospective payment rates as described in section II.D. of this addendum. For discussion purposes, it is necessary to present the adjusted standardized amounts divided into labor and nonlabor portions. Tables 1a, 1b, and 1c, as set forth in this addendum, contain the actual labor-related and nonlabor-related shares that will be used to calculate the prospective payment rates for hospitals located in the 50 States, the District of Columbia, and Puerto Rico.

1. Adjustment for Area Wage Levels

Sections 1886(d)(2)(H) and 1886(d)(9)(C)(iv) of the Act require that an adjustment be made to the labor-related portion of the prospective payment rates to account for area differences in hospital wage levels. This adjustment is made by the intermediaries by multiplying the labor-related portion of the adjusted standardized amounts by the appropriate wage index for the area in which the hospital is located. In section III of the preamble to this final rule, we discuss certain revisions we are making to the wage index. This index is set forth in Tables 4a, 4b, and 4c of this addendum.

2. Adjustment for Cost of Living in Alaska and Hawaii

Section 1886(d)(5)(C)(iv) of the Act authorizes an adjustment to take into account the unique circumstances of hospitals in Alaska and Hawaii. Higher labor-related costs for these two States are taken account of in the adjustment for area wages above. For FY 1990, the adjustment necessary for nonlabor-related costs for hospitals in Alaska and Hawaii will be made by the intermediaries by multiplying the nonlabor portion of the standardized amounts by the appropriate adjustment factor contained in the table below.

TABLE OF COST-OF-LIVING ADJUSTMENT FACTORS, ALASKA AND HAWAII HOSPITALS

Alaska—All areas	1.25
Hawaii:	
Oahu	1.225
Kauai	1.175
Maui	1.20
Molokai	1.20
Lanai	1.20
Hawaii	1.15

(The above factors are based on data obtained from the U.S. Office of Personnel Management.)

C. DRG Weighting Factors

As discussed in section II of the preamble to this final rule, we have developed a classification system for all hospital discharges, sorting them into DRGs, and have developed weighting factors for each DRG that are intended to reflect the resource utilization of cases in each DRG relative to that of the average Medicare case.

Table 5 of section IV of this addendum contains the weighting factors that we will use for discharges occurring in FY 1990. These factors have been recalibrated as explained in section II.C. of the preamble to this final rule.

D. Calculation of Prospective Payment Rates for FY 1990

General Formula for Calculation of Prospective Payment Rates for FY 1990
 Prospective Payment Rate for all hospitals located outside Puerto Rico except sole community hospitals = Federal Portion Prospective Payment Rate for Sole Community Hospitals = 75 percent of the hospital-specific portion + 25 percent of Federal portion
 Prospective Payment Rate for Puerto Rico Hospitals = 75 percent of the Puerto Rico rate + 25 percent of a discharge-weighted average of the large urban, other urban, and rural national rates

1. Federal Portion

For discharges on or after October 1, 1989 and before October 1, 1990, except for sole community hospitals and hospitals located in Puerto Rico, the hospital's rate is comprised exclusively of the Federal rate. The Federal rate is comprised of 100 percent of the Federal national rate except for those hospitals located in Census regions that have a regional rate that is higher than the national rate. The Federal rate for these hospitals equals 85 percent of the Federal national rate and 15 percent of the Federal regional rate. For discharges occurring on or after October 1, 1989 and before October 1, 1990, rural hospitals in regions I, II, III, and IV and urban and large urban hospitals in regions I, IV, and VI are affected by the regional floor. For sole community hospitals, the 25 percent Federal portion is based entirely on the Federal regional rate. The Federal rates are determined as follows:

Step 1—Select the appropriate regional or national adjusted standardized amount considering the type of hospital and designation of the hospital as large urban, other urban, or rural (see Tables 1a and 1b, section IV of this addendum).

Step 2—Multiply the labor-related portion of the standardized amount by the applicable wage index for the geographic area in which the hospital is located (see Tables 4a, 4b, and 4c, section IV of this addendum).

Step 3—For hospitals in Alaska and Hawaii, multiply the nonlabor-related portion of the standardized amount by the appropriate cost-of-living adjustment factor.

Step 4—Sum the amount from step 2 and the nonlabor portion of the

standardized amount (adjusted if appropriate under step 3).

Step 5—Multiply the final amount from step 4 by the weighting factor corresponding to the appropriate DRG (see Table 5, section IV of this addendum).

Step 6—For sole community hospitals, multiply the result in step 5 by 25 percent. The result is the Federal portion of the FY 1990 prospective payment for a given discharge for a sole community hospital.

2. Hospital-Specific Portion (Applicable Only to Sole Community Hospitals)

The hospital-specific portion of the prospective payment rate is based on a hospital's historical cost experience. For the first cost reporting period under prospective payment, a hospital-specific rate was calculated for each hospital, derived generally from the following formula:

$$\frac{\text{Base year costs per discharge}}{\text{1981 case-mix index}} \times \text{update factor} = \text{Hospital-specific rate}$$

For sole community hospitals, the hospital-specific portion equals 75 percent of the hospital-specific rate for all cost reporting periods beginning on or after October 1, 1983. For each subsequent cost reporting period, the hospital-specific portion is derived as follows:

Hospital-Specific Rate $\times$ Update Factor $\times$ DRG Weight $\times$.75.

For a more detailed discussion of the hospital-specific portion, we refer the reader to the September 1, 1983 interim final rule (48 FR 39772).

a. *Updating the Hospital-Specific Rates for FY 1990 Cost Reporting Periods.* For cost reporting periods beginning on or after October 1, 1989, we are increasing the hospital-specific rates by 5.5 percent (the market basket percentage increase) for hospitals located in all areas. As required by section 1886(b)(3)(B) of the Act, this is the same percentage increase by which we are increasing the Federal rates for FY 1990.

b. *Calculation of Hospital-Specific Portion.* For sole community hospital cost reporting periods beginning on or after October 1, 1989 and before October 1, 1990, the hospital-specific portion of a hospital's payment for a given discharge is calculated by—

Step 1—Multiplying the hospital's hospital-specific rate for the preceding cost reporting period by the applicable update factor (that is, 5.5 percent);

Step 2—Multiplying the amount resulting from Step 1 by the specific DRG weighting factor applicable to the discharge; and

Step 3—Multiplying the result in step 2 by 75 percent. (The result is the hospital-specific portion of the FY 1990 prospective payment for a given discharge for a sole community hospital. The prospective payment rate is the sum of this amount and the 25 percent

Federal portion, which is based entirely on the Federal regional rate.)

3. General Formula for Calculation of Prospective Payment Rates for Hospitals Located in Puerto Rico Beginning On or After October 1, 1989 and Before October 1, 1990

a. *Puerto Rico Rate.* Puerto Rico prospective payment rate is determined as follows:

Step 1—Select the appropriate adjusted average standardized amount considering the large urban, other urban, or rural designation of the hospital (see Table 1c, section IV of the addendum).

Step 2—Multiply the labor-related portion of the standardized amount by the appropriate wage index (see Tables 4a and 4b, section IV of the addendum).

Step 3—Sum the amount from step 2 and the nonlabor portion of the standardized amount.

Step 4—Multiply the result in step 3 by 75 percent.

Step 5—Multiply the amount from step 3 by the weighting factor corresponding to the appropriate DRG weight (see Table 5, section IV of the addendum).

b. *National Rate.* The national prospective payment rate is determined as follows:

Step 1—Multiply the labor-related portion of the national average standardized amount (see Table 1c, section IV of the addendum) by the appropriate wage index.

Step 2—Sum the amount from step 1 and the nonlabor portion of the national average standardized amount.

Step 3—Multiply the result in step 2 by 25 percent.

Step 4—Multiply the amount from step 3 by the weighting factor corresponding to the appropriate DRG weight (see Table 5, section IV of the addendum).

The sum of the Puerto Rico rate and the national rate computed above equals the prospective payment for a given

discharge for a hospital located in Puerto Rico.

III. Target Rate Percentages for Hospitals and Hospital Units Excluded From the Prospective Payment System

The inpatient operating costs of hospitals and hospital units excluded from the prospective payment system are subject to rate-of-increase limits established under the authority of section 1886(b) of the Act, which is implemented in § 413.40 of the regulations. Under these limits, an annual target amount (expressed in terms of the inpatient operating cost per discharge) is set for each hospital, based on the hospital's own historical cost experience, trended forward by the applicable update factors. This target amount is applied as a ceiling on the allowable costs per discharge for the hospital's next cost reporting period.

A hospital that has inpatient operating costs per discharge in excess of its target amount would be paid no more than that amount. However, a hospital that has inpatient operating costs less than its target amount would be paid its cost plus the lower of (1) 50 percent of the difference between the inpatient operating cost per discharge and the target amount, or (2) 5 percent of the target amount.

Each hospital's target amount is adjusted annually, before the beginning of its cost reporting period, by an applicable target rate percentage. For cost reporting periods beginning on or after October 1, 1989 and before October 1, 1990, section 1886(b)(3)(B)(ii) of the Act provides that the applicable percentage increase is the market basket percentage increase. In order to determine a hospital's target amount for its cost reporting period beginning in FY 1990, the hospital's target amount for its reporting period that began in FY 1989 is

increased by the market basket percentage for FY 1990. The most recent forecasted hospital market basket increase for FY 1990 is 5.5 percent. Therefore, the applicable percentage increase is also 5.5 percent.

Comment: We received one comment urging us to develop a separate market basket index for rehabilitation facilities.

Response: We agree that the development of a separate market basket for rehabilitation hospitals should be explored further. We are currently working with the National Association of Rehabilitation Facilities to develop data sources for constructing a market basket specific to those facilities. We intend to conduct an indepth analysis of this issue in conjunction with our overall rebasing of the hospital market basket for FY 1991 to determine whether separate market baskets should be established for hospitals and hospital units excluded from the prospective payment system.

IV. Tables

This section contains the tables referred to throughout the preamble to this proposed rule and in this

addendum. For purposes of this proposed rule, and to avoid confusion, we have retained the designations of Tables 1 through 5 that were first used in the September 1, 1983 initial prospective payment final rule (48 FR 39844). Tables 1a, 1b, 1c, 3C, 4a, 4b, 4c, 5, 6a, 6b, 6c, 6d, 6e, 6f, 7A, 7B, and 8 are presented below. The tables are as follows:

- Table 1a—National Adjusted Standardized Amounts, Labor/Nonlabor
- Table 1b—Regional Adjusted Standardized Amounts, Labor/Nonlabor
- Table 1c—Adjusted Standardized Amounts for Puerto Rico, Labor/Nonlabor
- Table 3C—Hospital Case Mix Indexes for Discharges Occurring in Federal Fiscal Year 1988
- Table 4a—Wage Index for Urban Areas
- Table 4b—Wage Index for Rural Areas
- Table 4c—Wage Index for Rural Counties Whose Hospitals are Deemed Urban
- Table 5—List of Diagnoses Related Groups (DRGs), Relative Weighting

Factors, Geometric Mean Length of Stay, and Length of Stay Outlier Cutoff Points Used in the Prospective Payment System

- Table 6a—New Diagnosis Codes
- Table 6b—New Procedure Codes
- Table 6c—Revised Procedure Code Titles and Inclusion Terms that Affect DRG Assignment
- Table 6d—Expanded Diagnoses Codes That Are No Longer Accepted in GROUPE
- Table 6e—Deleted Procedure Codes
- Table 6f—Additions to the CC Exclusions List
- Table 6g—Deletions To the CC Exclusions List
- Table 7A—Medicare Prospective Payment System Selected Percentile Lengths of Stay FY 88 MEDPAR Update 06/89 GROUPE V6.0
- Table 7B—Medicare Prospective Payment System Selected Percentile Lengths of Stay FY 88 MEDPAR Update 06/89 GROUPE V7.0
- Table 8—Statewide Average Cost-to-Charge Ratios for Urban and Rural Hospitals (Case Weighted)

TABLE 1A.—NATIONAL ADJUSTED STANDARDIZED AMOUNTS, LABOR/NONLABOR

Large Urban		Other Urban		Rural	
Labor-related	Nonlabor-related	Labor-related	Nonlabor-related	Labor-related	Nonlabor-related
2505.03	887.28	2480.65	878.63	2339.06	647.83

TABLE 1B.—REGIONAL ADJUSTED STANDARDIZED AMOUNTS, LABOR/NONLABOR

	Large Urban		Other Urban		Rural	
	Labor-related	Nonlabor-related	Labor-related	Nonlabor-related	Labor-related	Nonlabor-related
1. New England (CT, ME, MA, NH, RI, VT).....	2630.58	926.19	2604.96	917.16	2592.78	768.52
2. Middle Atlantic (PA, NJ, NY).....	2363.35	878.90	2340.33	870.34	2483.11	726.53
3. South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV).....	2522.75	809.79	2498.18	801.90	2373.67	629.99
4. East North Central (IL, IN, MI, OH, WI).....	2660.91	958.11	2635.00	948.78	2403.67	700.19
5. East South Central (AL, KY, MS, TN).....	2421.18	733.25	2397.60	726.11	2352.54	587.47
6. West North Central (IA, KS, MN, MO, NB, ND, SD).....	2523.45	873.01	2498.88	864.51	2286.58	627.63
7. West South Central (AR, LA, OK, TX).....	2508.92	804.31	2484.49	796.47	2192.92	577.20
8. Mountain (AZ, CO, ID, MT, NV, NM, UT, WY).....	2419.44	862.26	2395.88	853.87	2229.43	668.21
9. Pacific (AK, CA, HI, OR, WA).....	2354.23	984.11	2331.30	974.52	2156.83	747.88

TABLE 1C.—ADJUSTED STANDARDIZED AMOUNTS FOR PUERTO RICO, LABOR/NONLABOR

	Large Urban		Other Urban		Rural	
	Labor-related	Nonlabor-related	Labor-related	Nonlabor-related	Labor-related	Nonlabor-related
Puerto Rico.....	2225.10	398.08	2203.46	394.19	1563.45	289.41
National.....	2454.17	823.55				

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
010001	01.3323	010059	00.9487	010121	01.1169	030003	01.2704	030072	00.8331	030003	01.1169	030072	00.8331
010004	00.9950	010060	00.9816	010122	00.9712	030004	00.9037	030073	01.1578	030004	00.9037	030073	01.1578
010005	01.2027	010061	01.0002	010123	01.2478	030006	01.3852	030074	00.9466	030006	01.3852	030074	00.9466
010006	01.2029	010062	01.0249	010124	01.2483	030007	01.1920	030075	00.8694	030007	01.1920	030075	00.8694
010007	00.9655	010064	01.4782	010125	01.0647	030008	01.6144	030076	00.8608	030008	01.6144	030076	00.8608
010008	00.9981	010065	01.1163	010126	01.0286	030009	01.2465	030077	00.9068	030009	01.2465	030077	00.9068
010009	01.0368	010066	00.8811	010127	01.3304	030010	01.3638	030078	01.0305	030010	01.3638	030078	01.0305
010010	00.9472	010067	00.8548	010128	00.9550	030011	01.2561	030079	00.7869	030011	01.2561	030079	00.7869
010011	01.3067	010068	01.1429	010129	01.0179	030012	01.1499	030080	01.4609	030012	01.1499	030080	01.4609
010012	01.2941	010069	01.1148	010130	01.0799	030013	01.1675	030081	01.0101	030013	01.1675	030081	01.0101
010015	01.1440	010070	01.2452	010131	01.2956	030014	01.3308	030082	01.0429	030014	01.3308	030082	01.0429
010016	01.1381	010072	01.1122	010132	00.8999	030016	01.1547	030083	01.2082	030016	01.1547	030083	01.2082
010018	00.9354	010073	01.0224	010136	01.0222	030017	01.2642	030084	01.0401	030017	01.2642	030084	01.0401
010019	01.1179	010074	01.0678	010137	01.2616	030018	01.4289	030085	01.0853	030018	01.4289	030085	01.0853
010020	01.0774	010075	01.1002	010138	00.9836	030019	01.1468	030086	01.1655	030019	01.1468	030086	01.1655
010021	01.2682	010078	01.2298	010139	01.4340	030020	01.3560	030087	01.2580	030020	01.3560	030087	01.2580
010022	00.9900	010079	01.1517	010142	01.1192	030022	01.3105	030088	01.2418	030022	01.3105	030088	01.2418
010023	01.2103	010080	00.9319	010143	01.2137	030023	01.1931	030089	01.1867	030023	01.1931	030089	01.1867
010024	01.2850	010081	01.5270	010144	01.1044	030024	01.4137	030091	01.0034	030024	01.4137	030091	01.0034
010025	01.2184	010083	01.0309	010145	01.2502	030025	01.2559	030092	01.2154	030025	01.2559	030092	01.2154
010026	00.9205	010084	01.3202	010146	01.1272	030027	01.0454	030093	01.2969	030027	01.0454	030093	01.2969
010027	01.0227	010085	01.2300	010148	00.9764	030030	01.5223	040001	01.0658	030030	01.5223	040001	01.0658
010028	01.0693	010086	01.0433	010149	01.3305	030033	01.2807	040002	01.0568	030033	01.2807	040002	01.0568
010029	01.3459	010087	01.2380	010150	01.0084	030034	01.2289	040003	00.9788	030034	01.2289	040003	00.9788
010030	01.0154	010089	01.0266	010152	01.2252	030035	01.1515	040004	01.2534	030035	01.1515	040004	01.2534
010031	01.2219	010090	01.3389	010153	00.8755	030036	01.1710	040005	01.0732	030036	01.1710	040005	01.0732
010032	00.9136	010091	01.0891	020001	01.4185	030037	01.6439	040006	00.9873	030037	01.6439	040006	00.9873
010033	01.6912	010092	01.3239	020002	01.1255	030038	01.4410	040007	01.4103	030038	01.4410	040007	01.4103
010034	01.1207	010094	01.1733	020004	01.0256	030040	01.0100	040008	01.0481	030040	01.0100	040008	01.0481
010035	01.1346	010095	00.9791	020005	00.8449	030041	00.9199	040010	01.1605	030041	00.9199	040010	01.1605
010036	01.0855	010096	00.9393	020006	01.1086	030043	01.0353	040011	00.8855	030043	01.0353	040011	00.8855
010038	01.0836	010097	01.0840	020007	00.8032	030044	01.0714	040013	00.9818	030044	01.0714	040013	00.9818
010039	01.5540	010098	01.0919	020008	01.0057	030046	01.0241	040014	01.1547	030046	01.0241	040014	01.1547
010040	01.2011	010099	00.9978	020009	00.8053	030047	00.9949	040015	01.2037	030047	00.9949	040015	01.2037
010041	00.7688	010100	01.1851	020010	00.8611	030049	01.0155	040016	01.3656	030049	01.0155	040016	01.3656
010043	00.9754	010101	01.0349	020011	00.9442	030051	01.2005	040017	01.2014	030051	01.2005	040017	01.2014
010044	00.9591	010102	00.9106	020012	01.3460	030054	00.9302	040018	01.1116	030054	00.9302	040018	01.1116
010045	01.0499	010103	01.4882	020013	00.9616	030055	01.1130	040019	01.2344	030055	01.1130	040019	01.2344
010046	01.2305	010104	01.5130	020014	01.0133	030057	01.2363	040020	01.3728	030057	01.2363	040020	01.3728
010047	00.9099	010108	01.1613	020017	01.2517	030059	01.4259	040021	01.0304	030059	01.4259	040021	01.0304
010049	01.0494	010109	01.0118	020018	00.9737	030060	01.2124	040022	01.4868	030060	01.2124	040022	01.4868
010050	00.9496	010110	00.8958	020019	00.9448	030061	01.3325	040024	00.9534	030061	01.3325	040024	00.9534
010051	00.9060	010112	01.0857	020020	00.9096	030062	01.2465	040025	00.9466	030062	01.2465	040025	00.9466
010052	01.0256	010114	01.2392	020021	00.8813	030063	01.1479	040026	01.2818	030063	01.1479	040026	01.2818
010053	00.9664	010115	00.9556	020024	01.0042	030064	01.4152	040027	01.1728	030064	01.4152	040027	01.1728
010054	01.1528	010116	00.9566	020025	00.9763	030065	01.3409	040028	01.0402	030065	01.3409	040028	01.0402
010055	01.2482	010117	00.9720	020026	01.3078	030067	01.0160	040029	00.9560	030067	01.0160	040029	00.9560
010056	01.1818	010118	01.1612	020027	00.9558	030068	01.0702	040030	00.9606	030068	01.0702	040030	00.9606
010057	01.1238	010119	01.1722	030001	01.2345	030069	01.1806	040031	00.9606	030069	01.1806	040031	00.9606
010058	01.0439	010120	00.9866	030002	01.4918	030071	00.9573	040032	00.9892	030071	00.9573	040032	00.9892

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
040033	00.8320	040109	01.1715	050053	01.2667	050112	01.3611	050174	01.5085	050112	01.3611	050174	01.5085
040035	00.9659	040114	01.6633	050054	01.2050	050113	01.1816	050175	01.2407	050113	01.1816	050175	01.2407
040036	01.1931	040115	01.0539	050055	01.1775	050114	01.4370	050177	01.3390	050114	01.4370	050177	01.3390
040037	01.0256	040116	01.2860	050056	01.2183	050115	01.3957	050179	01.2359	050115	01.3957	050179	01.2359
040039	00.9707	040118	01.0794	050057	01.3002	050116	01.3967	050180	01.4013	050116	01.3967	050180	01.4013
040040	00.9566	040119	01.1330	050058	01.3415	050117	01.2485	050181	01.2994	050117	01.2485	050181	01.2994
040041	01.1646	040122	01.0917	050060	01.3375	050118	01.1957	050183	01.2308	050118	01.1957	050183	01.2308
040042	01.2529	040123	00.9324	050061	01.2148	050121	01.1545	050186	01.3316	050121	01.1545	050186	01.3316
040043	01.1359	040124	01.1237	050063	01.3475	050122	01.4556	050187	00.8493	050122	01.4556	050187	00.8493
040044	00.8989	040126	00.9591	050065	01.4082	050124	01.2544	050188	01.3599	050124	01.2544	050188	01.3599
040045	00.9935	040130	01.0407	050066	01.2320	050125	01.2117	050189	00.9819	050125	01.2117	050189	00.9819
040047	00.9991	040131	00.9356	050067	01.1936	050126	01.2724	050190	01.0776	050126	01.2724	050190	01.0776
040048	01.1068	050002	01.1776	050068	01.1379	050127	01.2327	050191	01.3909	050127	01.2327	050191	01.3909
040050	01.0814	050004	01.1621	050069	01.4281	050128	01.4218	050192	01.0402	050128	01.4218	050192	01.0402
040051	00.9551	050006	01.2805	050070	01.2173	050129	01.4913	050193	01.3601	050129	01.4913	050193	01.3601
040053	01.0292	050007	01.3889	050071	01.1713	050131	01.2813	050194	01.2582	050131	01.2813	050194	01.2582
040054	01.0842	050008	01.4204	050072	01.2311	050132	01.2139	050195	01.3237	050132	01.2139	050195	01.3237
040055	01.2690	050009	01.4131	050073	01.1822	050133	01.1724	050196	01.2372	050133	01.1724	050196	01.2372
040058	00.9403	050011	01.1089	050074	00.9901	050134	01.1953	050197	01.7021	050134	01.1953	050197	01.7021
040060	01.0255	050013	02.1054	050075	01.2112	050135	01.4505	050199	01.2073	050135	01.4505	050199	01.2073
040062	01.1716	050014	01.1139	050076	01.4465	050136	01.2158	050201	01.1302	050136	01.2158	050201	01.1302
040063	01.3196	050015	01.2796	050077	01.4250	050137	01.1724	050202	01.2521	050137	01.1724	050202	01.2521
040064	00.9950	050016	01.1361	050078	01.1858	050138	01.4734	050204	01.3816	050138	01.4734	050204	01.3816
040066	00.9439	050017	01.6417	050079	01.3671	050139	01.2123	050205	01.1552	050139	01.2123	050205	01.1552
040067	01.0079	050018	01.2035	050080	01.1961	050140	01.2120	050207	01.1780	050140	01.2120	050207	01.1780
040069	01.0313	050019	00.9333	050081	01.5075	050141	01.0951	050208	01.2112	050141	01.0951	050208	01.2112
040070	00.8963	050021	01.2466	050082	01.3328	050143	01.2402	050211	01.2772	050143	01.2402	050211	01.2772
040071	01.2298	050022	01.3733	050084	01.4191	050144	01.5536	050212	01.0880	050144	01.5536	050212	01.0880
040072	01.0790	050024	01.2360	050086	01.0974	050145	01.2184	050213	01.2401	050145	01.2184	050213	01.2401
040074	01.1025	050025	01.5264	050087	01.3770	050146	01.3138	050214	01.3467	050146	01.3138	050214	01.3467
040075	01.1303	050026	01.5395	050088	01.0238	050147	00.7311	050215	01.4169	050147	00.7311	050215	01.4169
040076	00.9550	050028	01.2169	050089	01.3133	050148	01.1158	050217	01.1309	050148	01.1158	050217	01.1309
040077	00.9430	050029	01.2380	050090	01.2518	050149	01.2074	050219	01.4075	050149	01.2074	050219	01.4075
040078	01.1990	050030	01.2198	050091	01.1467	050150	01.2319	050220	01.2704	050150	01.2319	050220	01.2704
040080	01.0379	050032	01.1496	050092	01.1207	050151	01.1974	050221	01.4419	050151	01.1974	050221	01.4419
040081	00.9393	050033	01.3292	050093	01.4737	050152	01.3162	050222	01.3179	050152	01.3162	050222	01.3179
040082	01.1100	050034	01.2101	050095	01.0860	050153	01.5095	050224	01.3899	050153	01.5095	050224	01.3899
040084	01.0485	050036	01.5081	050096	01.1578	050154	01.2789	050225	01.2465	050154	01.2789	050225	01.2465
040085	01.0839	050038	01.2358	050097	01.2757	050155	01.2010	050226	01.4238	050155	01.2010	050226	01.4238
040088	01.1150	050039	01.5030	050099	01.3823	050158	01.4183	050228	01.2762	050158	01.4183	050228	01.2762
040090	00.9635	050040	01.1392	050100	01.6447	050159	01.2560	050229	01.2674	050159	01.2560	050229	01.2674
040091	01.1012	050041	01.1636	050101	01.3418	050161	01.6589	050230	01.3148	050161	01.6589	050230	01.3148
040093	00.9821	050042	01.2183	050102	01.2789	050164	01.3748	050231	01.4466	050164	01.3748	050231	01.4466
040095	00.9836	050043	01.5241	050103	01.4707	050166	01.2522	050232	01.6377	050166	01.2522	050232	01.6377
040098	01.1448	050045	01.1593	050104	01.3281	050167	01.3309	050233	01.2011	050167	01.3309	050233	01.2011
040100	01.0919	050046	01.2102	050107	01.3261	050168	01.5003	050234	01.2492	050168	01.5003	050234	01.2492
040105	01.0293	050047	01.5210	050108	01.3474	050169	01.3919	050235	01.3653	050169	01.3919	050235	01.3653
040106	01.0299	050049	01.2847	050109	01.9286	050170	01.3612	050236	01.2371	050170	01.3612	050236	01.2371
040107	01.0517	050051	01.2033	050110	01.1024	050172	01.2056	050238	01.3057	050172	01.2056	050238	01.3057
040108	00.9163	050052	01.0887	050111	01.1216	050173	01.3680	050239	01.3413	050173	01.3680	050239	01.3413

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CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

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PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX
050240 01.3202	050312 01.5705	050390 01.2672	050439 01.2627	050549 01.5589	050549 01.5589
050241 01.1523	050313 01.1354	050391 01.2083	050439 01.8591	050550 01.2949	050550 01.2949
050242 01.3376	050315 01.3650	050392 00.9536	050439 01.2440	050551 01.3315	050551 01.3315
050243 01.2716	050317 01.2180	050393 01.3994	050439 01.3703	050552 01.1358	050552 01.1358
050245 01.5305	050319 01.2822	050394 01.3550	050439 01.0002	050557 01.2629	050557 01.2629
050248 01.1409	050320 01.1880	050395 01.1764	050439 01.1106	050559 01.3571	050559 01.3571
050251 01.0904	050324 01.6757	050396 01.4074	050439 01.1535	050560 01.1535	050560 01.1535
050253 01.1636	050325 01.2480	050397 01.0896	050439 01.2555	050561 01.0857	050561 01.0857
050254 01.1349	050326 01.3226	050401 01.2496	050439 01.2700	050564 01.1760	050564 01.1760
050256 01.5249	050327 01.5231	050404 01.1114	050439 01.2198	050565 01.1895	050565 01.1895
050257 01.3900	050328 01.2604	050406 00.9931	050439 01.1014	050566 01.0233	050566 01.0233
050260 01.3555	050329 01.2649	050407 01.1869	050439 01.3763	050567 01.4045	050567 01.4045
050261 01.1534	050331 01.2935	050410 01.0763	050439 01.8871	050568 01.2793	050568 01.2793
050262 01.5046	050334 01.3374	050413 01.2518	050439 01.5009	050569 01.2311	050569 01.2311
050263 01.2880	050335 01.2084	050414 01.2364	050439 01.5445	050570 01.5418	050570 01.5418
050264 01.3297	050336 01.3042	050417 01.1824	050439 01.2218	050571 01.3946	050571 01.3946
050267 01.4365	050337 01.1419	050418 01.1439	050439 01.1813	050572 01.4029	050572 01.4029
050268 01.2128	050342 01.2927	050419 01.1236	050439 01.3113	050575 01.0758	050575 01.0758
050269 01.2008	050343 01.1000	050420 01.3588	050439 01.2859	050577 01.2635	050577 01.2635
050270 01.3023	050345 01.3190	050421 01.2591	050439 01.1497	050579 01.3711	050579 01.3711
050272 01.1716	050348 01.8231	050423 01.0788	050439 01.6004	050580 01.1685	050580 01.1685
050273 00.5383	050349 01.0648	050424 01.5802	050439 00.9653	050581 01.3241	050581 01.3241
050274 00.9658	050350 01.3383	050425 01.1837	050439 01.1855	050583 01.7626	050583 01.7626
050276 01.0592	050351 01.4674	050426 01.2516	050439 01.6883	050584 01.2916	050584 01.2916
050277 01.2897	050352 01.2660	050427 00.9503	050439 01.4061	050585 01.2355	050585 01.2355
050278 01.3571	050353 01.5929	050430 00.9336	050439 01.2844	050586 01.2365	050586 01.2365
050279 01.1661	050355 00.8626	050431 01.1358	050439 01.2189	050587 01.2338	050587 01.2338
050280 01.2476	050357 01.6695	050432 01.3550	050439 01.1563	050588 01.2000	050588 01.2000
050281 01.2653	050359 01.0590	050433 01.0408	050439 01.2995	050589 01.3903	050589 01.3903
050282 01.2999	050360 01.2458	050434 01.1193	050439 01.3468	050590 01.3097	050590 01.3097
050283 01.2999	050362 00.8809	050435 01.1210	050439 01.1700	050591 01.2169	050591 01.2169
050286 01.0267	050363 01.2572	050436 01.0664	050439 01.3286	050592 01.2807	050592 01.2807
050289 01.6235	050366 01.1786	050438 01.3959	050439 01.1061	050593 01.2336	050593 01.2336
050290 01.3786	050367 01.2271	050440 01.1207	050439 01.2280	050594 01.9675	050594 01.9675
050291 01.1535	050369 01.2594	050441 01.6051	050439 01.3061	050597 01.2060	050597 01.2060
050292 01.1588	050371 00.9115	050442 01.1915	050439 01.1636	050598 01.2535	050598 01.2535
050293 00.9616	050372 01.0993	050443 00.9151	050439 01.2270	050599 01.3897	050599 01.3897
050295 01.3257	050373 01.1240	050444 01.1932	050439 01.1301	050601 01.1702	050601 01.1702
050296 01.1438	050375 01.2832	050446 00.8684	050439 01.3056	050603 01.3977	050603 01.3977
050298 01.1784	050377 01.0249	050447 01.3334	050439 01.3673	050604 01.3144	050604 01.3144
050299 01.2985	050378 01.1356	050448 01.0276	050439 01.1842	050605 00.6935	050605 00.6935
050300 01.2769	050379 01.0526	050449 01.2472	050439 01.2338	050607 01.1649	050607 01.1649
050301 01.2664	050380 01.5331	050450 01.1238	050439 01.4234	050608 01.1540	050608 01.1540
050302 01.2239	050381 01.0564	050451 01.0223	050439 01.1133	050609 01.2445	050609 01.2445
050305 01.3562	050382 01.3035	050454 01.6454	050439 01.2705	050613 01.0349	050613 01.0349
050307 01.3439	050383 01.3060	050455 01.5289	050439 01.2536	050615 01.2331	050615 01.2331
050308 01.4972	050385 01.2893	050456 01.3371	050439 00.8263	050616 01.1646	050616 01.1646
050309 01.2798	050387 00.9814	050457 01.4931	050439 01.0182	050618 01.1683	050618 01.1683
050310 01.1231	050388 00.8678	050458 01.1370	050439 00.8851	050619 01.3171	050619 01.3171

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TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1989

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PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX	PROVIDER CASE MIX
050622 01.2039	060016 01.1405	060074 00.9814	070036 01.2875	100034 01.3796
050623 01.2593	060017 01.2663	060075 01.2020	080001 01.4167	100035 01.3137
050624 01.1636	060018 01.1005	060076 01.3171	080002 01.1621	100036 01.2926
050625 01.3732	060019 01.5768	060077 01.1313	080003 01.2409	100037 01.4751
050630 01.0698	060020 01.3971	060083 00.6641	080004 01.2112	100038 01.3690
050633 01.2121	060022 01.4887	060085 00.9936	080005 01.1285	100040 01.4422
050635 01.3172	060023 01.3197	060087 01.2402	080006 01.1417	100042 01.2027
050636 01.2470	060024 01.4661	060088 01.1281	080007 01.1623	100043 01.2608
050637 01.2542	060026 01.3739	060090 00.9943	090001 01.3475	100044 01.2920
050638 00.9128	060027 01.2248	060092 00.7056	090002 01.1424	100045 01.2845
050643 00.9224	060028 01.3560	060093 01.0628	090003 01.3856	100046 01.2418
050644 01.2566	060029 00.9838	060096 01.0669	090004 01.4704	100047 01.1914
050649 01.2976	060030 01.2319	060098 01.2286	090005 01.2595	100048 00.9625
050650 01.2432	060031 01.3805	060099 00.9974	090006 01.2390	100049 01.2867
050651 01.2548	060032 01.3356	060100 01.0883	090007 01.1040	100050 01.1072
050655 01.1354	060033 01.2009	060101 01.5103	090008 01.2189	100051 01.1543
050660 01.1302	060034 01.2374	070001 01.7319	090009 01.2033	100052 01.2479
050661 00.9277	060035 01.2236	070002 01.5746	090010 01.0127	100053 01.1222
050662 00.8358	060036 01.1387	070003 01.2008	090011 01.5682	100054 01.3627
050663 01.2305	060037 01.0182	070004 01.2247	100001 01.3081	100055 01.2602
050666 00.9763	060038 01.1751	070005 01.2908	100002 01.3529	100056 01.2719
050667 01.2022	060039 01.1178	070006 01.2351	100004 01.1037	100057 01.2531
050668 01.2687	060041 01.0042	070007 01.2556	100005 01.0268	100059 01.4902
050669 00.9473	060042 00.9410	070008 01.1477	100006 01.4398	100060 01.4978
050670 00.8219	060043 01.0353	070009 01.2556	100007 01.7469	100061 01.3168
050671 00.9506	060044 01.1843	070010 01.4327	100008 01.5556	100062 01.3162
050672 00.6719	060045 01.0147	070011 01.2703	100009 01.3546	100063 01.2653
050674 01.1615	060046 01.1156	070012 01.2015	100010 01.2835	100065 01.0732
050675 01.2284	060047 01.0551	070013 01.2353	100011 00.9283	100067 01.3068
050676 00.9595	060049 01.1052	070014 01.1263	100012 01.3405	100068 01.2261
050677 01.2103	060050 01.1550	070015 01.2552	100013 00.7921	100069 01.3026
050678 01.1890	060051 01.3318	070016 01.2666	100014 01.1470	100070 01.3341
050679 01.1342	060052 00.9367	070017 01.3511	100015 01.2539	100071 01.2785
050680 01.1308	060053 00.8630	070018 01.1637	100016 01.0029	100072 01.1712
050681 00.8187	060054 01.2174	070019 01.1997	100017 01.3505	100073 01.5936
060001 01.3818	060056 00.9159	070020 01.3604	100018 01.3391	100074 01.2238
060003 01.1873	060057 01.3100	070021 01.2239	100019 01.4188	100075 01.5735
060004 01.0924	060058 00.8522	070022 01.6355	100020 01.2500	100076 01.2323
060005 01.4978	060060 01.0320	070023 01.2006	100021 01.2203	100077 01.2384
060006 01.1427	060062 00.9602	070024 01.1766	100022 01.4570	100078 01.1762
060007 01.1620	060063 01.1085	070025 01.5334	100023 01.3249	100079 01.2304
060008 01.1729	060064 01.2970	070026 01.2631	100024 01.1615	100080 01.4212
060009 01.2728	060065 01.2267	070027 01.2848	100025 01.4592	100081 01.1194
060010 01.5160	060066 01.0242	070028 01.3755	100026 01.3692	100082 01.3717
060011 01.1930	060067 01.0008	070029 01.2852	100027 00.9261	100083 01.1613
060012 01.3814	060068 01.1922	070030 01.1871	100028 01.2215	100084 01.3215
060013 01.2418	060070 01.1793	070031 01.2584	100029 01.2659	100085 01.1913
060014 01.4544	060071 01.2041	070033 01.1819	100030 01.0543	100086 01.2335
060015 01.3360	060072 00.9641	070034 01.2484	100032 01.3129	100087 01.6093
	060073 00.8913	070035 01.2778	100033 01.3391	100088 01.3112

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TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
100089	01.2439	100156	01.0344	100223	01.1732	110005	01.1732	110064	01.2078
100090	01.1896	100157	01.0357	100224	01.1711	110006	01.2111	110065	01.0960
100091	01.1733	100158	01.0378	100225	01.1731	110007	01.2314	110066	01.0966
100092	01.3042	100159	01.1457	100226	01.1986	110008	01.1121	110067	01.1053
100093	01.0037	100160	01.1286	100227	01.0166	110009	01.0712	110068	00.9464
100094	01.2204	100161	01.3285	100228	01.1859	110010	01.8228	110069	00.9615
100095	01.1461	100162	01.2517	100229	01.3845	110011	01.1835	110070	00.9561
100100	01.1519	100163	00.9849	100230	01.2001	110012	01.0359	110071	00.9615
100101	01.1519	100164	00.9849	100231	01.4925	110013	01.1835	110072	00.9561
100102	00.9794	100165	00.9849	100232	01.1499	110014	01.0318	110073	01.0337
100103	01.2824	100166	01.2741	100233	01.1983	110015	01.0518	110074	01.2220
100104	01.1244	100167	01.2930	100234	01.1961	110016	01.1893	110075	01.1837
100105	01.2240	100168	01.5782	100235	01.2867	110017	00.9315	110076	01.2738
100106	01.1244	100169	01.1995	100236	01.3131	110018	01.1184	110077	01.0044
100107	01.0484	100170	01.1995	100237	01.7622	110019	01.184	110078	01.4402
100108	01.2134	100171	01.2472	100238	01.3597	110020	01.1538	110079	01.0813
100109	01.3730	100172	01.2385	100239	01.3820	110021	01.1261	110080	01.1207
100110	00.9891	100173	01.4601	100240	00.7356	110022	01.2554	110081	01.0295
100111	01.5920	100174	01.1159	100241	00.9674	110023	01.2102	110082	01.7406
100112	01.2705	100175	01.7406	100242	01.2099	110024	01.0975	110083	01.2816
100113	01.2038	100176	01.3244	100243	01.2665	110025	01.0260	110084	01.1082
100114	01.1613	100177	01.3986	100244	01.2665	110026	01.1779	110085	01.1476
100115	01.1380	100178	01.1260	100245	01.4695	110027	01.1496	110086	01.1889
100116	01.1391	100179	01.2472	100246	01.2221	110028	01.1556	110087	00.8405
100117	01.3256	100180	01.0834	100247	01.2221	110029	01.1496	110088	01.2271
100118	01.3132	100181	01.3342	100248	01.2221	110030	01.2283	110089	01.1214
100119	01.1170	100182	01.2626	100249	01.2101	110031	01.2584	110090	01.0373
100120	01.3190	100183	01.2374	100250	01.2383	110032	01.1853	110091	01.0021
100121	01.4047	100184	01.2512	100251	01.2383	110033	01.1501	110092	01.2340
100122	02.1617	100185	01.2502	100252	01.3105	110034	01.1423	110093	01.0874
100123	01.2448	100186	01.2166	100253	01.4676	110035	01.1976	110094	01.0672
100124	01.2279	100187	01.2432	100254	01.2021	110036	01.1862	110095	00.9585
100125	01.2374	100188	01.2923	100255	01.2029	110037	00.9308	110096	00.8753
100126	01.3200	100189	01.2576	100256	01.2740	110038	01.1520	110097	01.0797
100127	01.4047	100190	01.2147	100257	01.2512	110039	01.0275	110098	00.9882
100128	02.1617	100191	01.4530	100258	01.3137	110040	01.4242	110099	00.9287
100129	01.2448	100192	01.2502	100259	01.3137	110041	01.0848	110100	01.0751
100130	01.2279	100193	01.2166	100260	01.1590	110042	01.0337	110101	01.1152
100131	01.2374	100194	01.2432	100261	01.2993	110043	01.1974	110102	01.4814
100132	01.3200	100195	01.2923	100262	01.2993	110044	01.1226	110103	00.9165
100133	00.9750	100196	01.3008	100263	01.2541	110045	00.9978	110104	00.9809
100134	01.4539	100197	01.3680	100264	01.2838	110046	01.0291	110105	00.9862
100135	01.4539	100198	01.3296	100265	00.8878	110047	00.9425	110106	00.9585
100136	01.1887	100199	01.3431	100266	01.0613	110048	00.8839	110107	00.9734
100137	01.1887	100200	01.3531	100267	01.1831	110049	00.9327	110108	01.0637
100138	01.1820	100201	01.1275	100268	01.0925	110050	00.9175	110109	01.9655
100139	01.1074	100202	01.0052	100269	01.1374	110051	00.9175	110110	01.0048
100140	01.0621	100203	01.0052	100270	01.1374	110052	00.9332	110111	00.9332
100141	01.0621	100204	01.0052	100271	01.1628	110053	00.9585	110112	01.0583
100142	01.0621	100205	01.0052	100272	01.1628	110054	00.9585	110113	00.9764
100143	01.0621	100206	01.0052	100273	01.1628	110055	01.0487	110114	01.1853
100144	01.0621	100207	01.0052	100274	01.1628	110056	01.0487	110115	01.1853
100145	01.0621	100208	01.0052	100275	01.1628	110057	01.0487	110116	01.1853
100146	01.0621	100209	01.0052	100276	01.1628	110058	01.0487	110117	01.1853
100147	01.0621	100210	01.0052	100277	01.1628	110059	01.0487	110118	01.1853
100148	01.0621	100211	01.0052	100278	01.1628	110060	01.0487	110119	01.1853
100149	01.0621	100212	01.0052	100279	01.1628	110061	01.0487	110120	01.1853
100150	01.0621	100213	01.0052	100280	01.1628	110062	01.0487	110121	01.1853
100151	01.0621	100214	01.0052	100281	01.1628	110063	01.0487	110122	01.1853
100152	01.0621	100215	01.0052	100282	01.1628	110064	01.0487	110123	01.1853
100153	01.0621	100216	01.0052	100283	01.1628	110065	01.0487	110124	01.1853
100154	01.0621	100217	01.0052	100284	01.1628	110066	01.0487	110125	01.1853
100155	01.0621	100218	01.0052	100285	01.1628	110067	01.0487	110126	01.1853
100156	01.0621	100219	01.0052	100286	01.1628	110068	01.0487	110127	01.1853
100157	01.0621	100220	01.0052	100287	01.1628	110069	01.0487	110128	01.1853
100158	01.0621	100221	01.0052	100288	01.1628	110070	01.0487	110129	01.1853
100159	01.0621	100222	01.0052	100289	01.1628	110071	01.0487	110130	01.1853
100160	01.0621	100223	01.0052	100290	01.1628	110072	01.0487	110131	01.1853
100161	01.0621	100224	01.0052	100291	01.1628	110073	01.0487	110132	01.1853
100162	01.0621	100225	01.0052	100292	01.1628	110074	01.0487	110133	01.1853
100163	01.0621	100226	01.0052	100293	01.1628	110075	01.0487	110134	01.1853
100164	01.0621	100227	01.0052	100294	01.1628	110076	01.0487	110135	01.1853
100165	01.0621	100228	01.0052	100295	01.1628	110077	01.0487	110136	01.1853
100166	01.0621	100229	01.0052	100296	01.1628	110078	01.0487	110137	01.1853
100167	01.0621	100230	01.0052	100297	01.1628	110079	01.0487	110138	01.1853
100168	01.0621	100231	01.0052	100298	01.1628	110080	01.0487	110139	01.1853
100169	01.0621	100232	01.0052	100299	01.1628	110081	01.0487	110140	01.1853
100170	01.0621	100233	01.0052	100300	01.1628	110082	01.0487	110141	01.1853
100171	01.0621	100234	01.0052	100301	01.1628	110083	01.0487	110142	01.1853
100172	01.0621	100235	01.0052	100302	01.1628	110084	01.0487	110143	01.1853
100173	01.0621	100236	01.0052	100303	01.1628	110085	01.0487	110144	01.1853
100174	01.0621	100237	01.0052	100304	01.1628	110086	01.0487	110145	01.1853
100175	01.0621	100238	01.0052	100305	01.1628	110087	01.0487	110146	01.1853
100176	01.0621	100239	01.0052	100306	01.1628	110088	01.0487	110147	01.1853
100177	01.0621	100240	01.0052	100307	01.1628	110089	01.0487	110148	01.1853
100178	01.0621	100241	01.0052	100308	01.1628	110090	01.0487	110149	01.1853
100179	01.0621	100242	01.0052	100309	01.1628	110091	01.0487	110150	01.1853
100180	01.0621	100243	01.0052	100310	01.1628	110092	01.0487	110151	01.1853
100181	01.0621	100244	01.0052	100311	01.1628	110093	01.0487	110152	01.1853
100182	01.0621	100245	01.0052	100312	01.1628	110094	01.0487	110153	01.1853
100183	01.0621	100246	01.0052	100313	01.1628	110095	01.0487	110154	01.1853
100184	01.0621	100247	01.0052	100314	01.1628	110096	01.0487	110155	01.1853
100185	01.0621	100248	01.0052	100315	01.1628	110097	01.0487	110156	01.1853
100186	01.0621	100249	01.0052	100316	01.1628	110098	01.0487	110157	01.1853
100187	01.0621	100250	01.0052	100317	01.1628	110099	01.0487	110158	01.1853
100188	01.0621	100251	01.0052	100318	01.1628	110100	01.0487	110159	01.1853
100189	01.0621	100252	01.0052	100319	01.1628	110101	01.0487	110160	01.1853
100190	01.0621	100253	01.0052	100320	01.1628	110102	01.0487	110161	01.1853
100191	01.0621	100254	01.0052	100321	01.1628	110103	01.0487	110162	01.1853
100192	01.0621	100255	01.0052	100322	01.1628	110104	01.0487	110163	01.1853
100193	01.0621	100256	01.0052	100323	01.1628	110105	0		

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

PAGE 6 OF 24

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
110123	00.8745	110187	01.0233	130017	00.9754	140027	01.1092	140087	01.2897
110124	01.0393	110188	01.2368	130018	01.3787	140029	01.2832	140088	01.5152
110125	01.0999	110189	01.0161	130019	01.1779	140030	01.3905	140089	01.1496
110126	00.9806	110190	01.0129	130021	01.0496	140031	01.0089	140090	01.2504
110127	01.1808	110191	01.2181	130022	01.2045	140032	01.1313	140091	01.3312
110128	01.3635	110192	01.2343	130024	01.1797	140033	01.2334	140093	01.1268
110130	01.0226	110193	01.0688	130025	00.9421	140034	01.1257	140094	01.2148
110131	00.9912	110194	00.9779	130026	01.1153	140035	01.0339	140095	01.3271
110132	01.1240	110195	01.0813	130027	00.9102	140036	01.0600	140097	01.0384
110133	00.9595	110196	01.7760	130028	01.1908	140037	01.0635	140098	01.2374
110134	00.8827	110198	01.2093	130029	01.0941	140038	01.0574	140099	01.1858
110135	01.0693	110200	01.4930	130030	00.9289	140039	01.0218	140100	01.2988
110136	01.1520	110201	01.2007	130031	01.0850	140040	01.1966	140101	01.1206
110140	00.9177	110202	01.0971	130034	00.9419	140041	01.0774	140102	01.0333
110141	00.9055	110203	00.9245	130035	01.1200	140042	01.0201	140103	01.1318
110142	01.1410	120001	01.5139	130036	01.1239	140043	01.1459	140104	01.1219
110143	01.2268	120002	01.0688	130037	01.2699	140045	01.0284	140105	01.2377
110144	01.2089	120003	01.0359	130038	00.9141	140046	01.1760	140107	00.9407
110146	00.8978	120004	01.2497	130039	01.1704	140047	01.0717	140108	01.1796
110149	01.0617	120005	01.1064	130040	01.0435	140048	01.1362	140109	00.9982
110150	01.1385	120006	01.1524	130043	01.0553	140049	01.2649	140110	01.1909
110151	01.0673	120007	01.5483	130044	00.9923	140051	01.1652	140112	01.1140
110152	00.9400	120008	01.0258	130045	00.9332	140052	01.1962	140113	01.4154
110153	01.0090	120009	00.9398	130048	00.9655	140053	01.5275	140114	01.1634
110154	01.0013	120010	01.4299	130049	01.2546	140054	01.3123	140115	01.1161
110155	01.0030	120011	01.2936	130050	00.8292	140055	01.0316	140116	01.2436
110156	00.9295	120012	01.0193	130051	01.0348	140058	01.0919	140117	01.1888
110157	01.1218	120014	01.1533	130054	00.8680	140059	01.0570	140118	01.3837
110161	01.2386	120015	00.7445	130056	00.9445	140061	01.1326	140119	01.4677
110162	00.8419	120016	01.0369	140001	01.2619	140062	01.2366	140120	01.1572
110163	01.2471	120018	00.8889	140002	01.2172	140063	01.2274	140121	00.9916
110164	01.2923	120019	01.0576	140003	00.9700	140064	01.2057	140122	01.2372
110165	01.1484	120021	00.8066	140004	01.0438	140065	01.2450	140123	01.1768
110166	01.2733	120022	01.4404	140005	00.8700	140066	01.1762	140124	01.1655
110168	01.3265	120024	00.9279	140007	01.1638	140067	01.5003	140125	01.2039
110169	00.7007	130001	00.9894	140008	01.2520	140068	01.2388	140126	01.4429
110170	00.8625	130002	01.3457	140010	01.3290	140069	01.0033	140127	01.1387
110171	01.1997	130003	01.2452	140011	01.0415	140070	01.3295	140128	01.0037
110172	01.0970	130005	01.2783	140012	01.2528	140072	01.1431	140129	01.0456
110174	00.9878	130006	01.5777	140013	01.2947	140074	01.0552	140130	01.1386
110175	00.9733	130007	01.3880	140014	00.9629	140075	01.2679	140132	01.3266
110176	01.1061	130008	00.8477	140015	01.1706	140077	01.0028	140133	01.2773
110177	01.3598	130009	01.0276	140016	00.9750	140079	01.2017	140134	00.7201
110178	01.0517	130010	01.0029	140017	01.2783	140080	01.5753	140135	01.1716
110179	01.1432	130011	01.3069	140018	01.3234	140081	01.0725	140136	01.1604
110181	01.0276	130012	00.9885	140019	00.9343	140082	01.2008	140137	01.0093
110183	01.1131	130013	01.1866	140023	01.1502	140083	01.1541	140138	01.1553
110184	01.1043	130014	01.2652	140024	00.9592	140084	01.2090	140139	01.0701
110185	01.0876	130015	01.0936	140025	01.0834	140085	01.1476	140140	01.0423
110186	01.0973	130016	00.9315	140026	01.1246	140086	01.0875	140141	01.0130

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
: CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
160031	01.0491	160083	01.3769	160146	01.2681	170051	01.0571
160032	01.0491	160085	01.1991	160147	01.2597	170052	01.1265
160033	01.2409	160086	00.9906	160151	01.1181	170053	00.9988
160034	01.0115	160088	01.0530	160152	00.9973	170054	01.2209
160035	00.9878	160089	01.1468	160153	01.4817	170055	01.0197
160036	01.2011	160090	01.0134	170001	01.1830	170056	00.9736
160037	01.0598	160091	01.1783	170002	01.3194	170057	01.0530
160038	01.2264	160092	01.0282	170003	01.0996	170058	01.0787
160039	01.0236	160093	00.9438	170004	01.0865	170060	00.9722
160040	01.2300	160094	01.0873	170005	00.9049	170061	01.0274
160041	01.0804	160095	01.1214	170006	01.1377	170062	00.9727
160043	00.9813	160097	01.2719	170007	01.1288	170063	00.9240
160044	01.2776	160098	01.1109	170008	00.9768	170064	01.0121
160045	01.4535	160099	01.0962	170009	01.1357	170066	00.9782
160046	01.0885	160101	01.1685	170010	01.1159	170067	01.0992
160047	01.3144	160102	01.2797	170011	01.2218	170068	00.9744
160048	01.0835	160103	00.9054	170012	01.4133	170069	00.9669
160049	00.9087	160104	01.1440	170013	01.2618	170070	00.9600
160050	01.0112	160105	01.1348	170014	01.0788	170072	01.1584
160051	01.1898	160107	01.0580	170015	01.1098	170073	01.1275
160052	01.0815	160108	01.1785	170016	01.4723	170074	01.1404
160053	01.1159	160109	00.9880	170017	01.1404	170075	00.8709
160054	01.0026	160110	01.3949	170018	01.0176	170076	01.1685
160055	01.0276	160111	01.1509	170019	01.2514	170077	00.9513
160056	01.0425	160112	01.2228	170020	01.1670	170079	00.9273
160057	01.2249	160113	01.0794	170021	01.0350	170080	01.1675
160058	01.5278	160114	01.0196	170022	01.1168	170081	00.9302
160059	01.1840	160115	01.0545	170023	01.1328	170082	00.9284
160060	01.0334	160116	01.0616	170024	01.1899	170084	01.0548
160061	01.0859	160117	01.3934	170025	01.1899	170085	01.4636
160062	01.0822	160118	01.0966	170026	01.0553	170086	01.3156
160063	01.1555	160119	00.8666	170027	01.0961	170087	01.0575
160064	01.2402	160120	00.9798	170028	01.0331	170088	00.8971
160065	01.0829	160121	01.1818	170029	00.9749	170089	00.9560
160066	01.1127	160122	01.1194	170030	01.1183	170090	01.0121
160067	01.1947	160123	01.2245	170031	01.1941	170092	01.0464
160068	00.9619	160124	01.1374	170032	00.9462	170093	01.0130
160069	01.2606	160125	01.0884	170033	00.9587	170094	01.0892
160070	00.9757	160126	01.1351	170034	01.0132	170095	00.9163
160071	01.1363	160127	01.1795	170035	01.1613	170097	01.0609
160072	01.0736	160128	01.2312	170036	01.0249	170098	01.1514
160073	00.9434	160129	01.1827	170037	01.0385	170099	01.1518
160074	01.1974	160130	00.9581	170038	01.3623	170100	00.8458
160075	01.0566	160131	00.8906	170039	01.0297	170101	01.1518
160076	00.9213	160132	01.0793	170040	01.0268	170102	00.9858
160077	00.9795	160133	01.0733	170041	01.0721	170103	01.2094
160078	01.2846	160134	00.9636	170042	00.9003	170104	01.3310
160079	01.0700	160135	01.0735	170043	00.9003	180001	01.1154
160080	01.0330	160136	01.0173	170044	01.2467	180002	01.0647
160081	01.0330	160137	01.0173	170045	01.2467	180004	01.1162
160082	01.5047	160138	01.0079	170046	01.2467	180005	01.0443
		160139	01.0079	170047	01.2467		
		160140	01.0079	170048	01.2467		
		160141	01.0079	170049	01.2467		
		160142	01.0079	170050	01.2467		
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		160274	01.0079				
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NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
: CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

[illegible]

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 : CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
230055	01.0954	230117	01.7576	230181	01.0443	230273	01.3125	240057	01.6040
230056	00.9836	230118	01.1963	230184	01.0618	230275	01.0995	240058	00.9494
230058	01.0956	230119	01.0749	230186	01.0428	230276	00.6868	240059	01.1073
230059	01.4062	230120	01.0767	230187	00.9695	230277	01.1199	240061	01.4398
230060	01.1136	230121	01.1401	230188	01.0988	240001	01.3670	240062	01.1046
230062	01.1000	230122	01.2599	230189	00.9550	240002	01.5274	240063	01.3529
230063	01.1930	230124	01.0674	230190	01.0681	240003	01.1562	240064	01.2343
230065	01.2420	230125	01.3085	230191	00.9144	240004	01.3926	240065	01.0160
230066	01.1651	230128	01.3377	230194	01.1860	240005	00.9498	240066	01.1826
230067	00.7144	230129	01.7785	230195	01.3029	240007	01.0425	240069	01.1179
230068	01.3264	230130	01.3703	230197	01.2396	240008	01.0385	240071	01.0801
230069	01.1155	230132	01.2694	230199	01.2055	240009	01.1232	240072	00.9897
230070	01.3053	230133	01.1763	230201	01.1043	240010	01.8396	240073	00.9722
230071	00.6673	230134	01.0516	230204	01.2917	240011	01.0428	240074	01.0013
230072	01.1201	230135	01.2460	230205	01.2330	240013	01.1298	240075	01.1787
230075	01.2539	230137	01.1077	230207	01.1710	240014	01.0838	240076	01.1198
230076	01.1415	230138	00.8733	230208	01.2603	240016	01.2604	240077	00.9802
230077	01.7574	230140	01.0999	230211	00.9552	240017	01.1821	240078	01.3305
230078	01.0825	230141	01.4146	230212	01.0251	240018	01.2200	240079	01.1436
230080	01.1817	230142	01.1548	230213	01.0119	240019	01.4872	240080	01.3569
230081	01.1169	230143	01.3385	230216	01.3133	240020	01.1860	240081	01.3057
230082	01.1564	230144	01.1805	230217	01.2730	240021	00.9939	240082	01.1684
230084	01.0395	230145	01.1808	230219	00.9027	240022	01.0313	240083	01.2638
230085	01.0948	230146	01.1845	230221	01.2411	240023	01.0254	240084	01.2638
230086	01.0318	230147	01.2642	230222	01.2021	240025	01.2362	240085	00.9170
230087	01.1045	230149	01.1482	230223	01.2882	240026	01.3236	240086	01.1239
230088	01.2799	230150	01.5696	230224	01.0872	240027	01.0598	240087	01.1926
230089	01.4326	230151	01.3513	230225	01.0319	240028	01.1894	240088	01.4173
230090	01.2767	230153	01.1942	230227	01.2163	240029	01.1545	240089	00.9598
230092	01.1347	230154	01.1114	230228	01.2585	240030	01.2960	240090	01.0692
230093	01.0810	230155	01.0295	230229	01.2835	240031	00.9293	240091	01.0723
230095	01.1043	230156	01.5113	230230	01.2835	240033	00.8306	240093	01.2947
230096	01.2554	230157	01.2645	230232	01.0369	240035	01.2799	240094	01.0434
230097	01.2083	230158	00.9684	230235	01.0277	240036	01.0034	240095	01.0709
230098	01.1173	230159	01.2578	230236	01.2794	240037	01.3056	240097	01.1411
230099	01.1029	230161	01.1880	230237	01.2039	240038	01.1092	240098	00.9346
230100	01.1057	230162	00.9881	230239	01.0967	240040	01.1393	240099	01.2099
230101	01.1982	230163	00.9437	230241	01.0972	240041	01.1439	240100	01.1675
230102	01.0671	230165	01.5701	230244	01.2753	240043	01.0755	240101	00.9537
230103	01.3915	230167	01.2092	230253	01.1008	240044	00.9907	240102	01.1468
230104	01.4191	230169	01.2130	230254	01.1904	240045	00.9907	240103	01.2139
230105	01.0605	230171	01.1895	230255	01.0306	240046	01.2568	240104	00.9201
230106	01.0302	230172	01.0934	230257	00.9777	240047	01.2754	240105	01.2271
230107	01.1270	230173	01.1681	230259	01.0991	240048	01.2490	240106	01.0318
230108	01.1940	230174	01.1716	230264	01.2189	240049	01.5048	240107	01.0412
230110	01.0071	230175	00.9602	230265	01.0108	240050	01.0628	240108	01.0505
230111	00.9583	230176	01.1130	230266	01.2566	240051	00.9497	240109	01.0476
230113	00.8589	230178	01.0964	230269	01.2283	240052	01.2328	240110	00.9839
230115	00.9262	230179	00.9550	230270	01.2020	240053	01.4172	240111	01.0634
230116	00.8698	230180	01.1016	230271	02.2639	240056	01.3214	240112	01.0634

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TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
240114	01.0467	240172	01.0652	250037	00.9556	250100	01.1637
240115	01.2388	240173	01.0630	250038	00.8645	250101	00.8906
240116	00.9791	240175	00.7999	250039	01.0037	250102	01.3812
240117	01.2106	240176	00.8914	250040	01.1035	250104	01.2098
240118	00.9722	240179	01.0460	250042	01.0990	250105	00.9585
240119	00.9282	240180	00.9391	250043	00.8879	250107	00.9062
240121	00.9187	240183	01.1668	250044	01.0065	250109	00.9612
240122	01.0723	240184	00.9863	250045	01.1037	250110	00.9216
240123	01.0558	240187	01.1465	250046	00.9832	250111	00.8421
240124	01.0347	240192	01.0696	250047	00.9154	250112	00.9931
240125	00.9985	240193	00.9419	250048	01.2514	250113	01.0023
240127	01.0015	240196	01.4155	250049	00.8886	250114	00.8673
240129	00.8928	240200	00.9228	250050	01.0879	250117	01.0068
240130	01.0214	240201	01.0748	250051	00.9338	250118	01.0498
240131	01.1856	240205	00.8532	250057	01.0724	250119	00.9650
240132	01.2136	240206	00.8990	250058	01.1308	250120	00.9759
240133	01.1796	240207	01.1778	250059	00.9974	250121	00.9793
240134	01.1563	240210	01.2887	250060	00.8446	250122	01.2053
240135	00.9003	250001	01.3808	250061	00.9994	250123	01.1410
240136	00.9770	250002	00.8896	250062	00.9482	250124	00.9062
240137	01.1120	250003	00.9490	250063	00.8951	250125	01.0824
240138	00.8462	250004	01.3244	250065	00.9982	250126	01.0144
240139	01.0202	250005	00.9580	250066	00.9279	250127	00.8654
240140	00.8270	250006	00.9914	250067	01.0870	250128	01.0252
240141	00.9528	250007	01.1214	250068	00.8595	250129	01.0524
240142	01.1080	250008	00.8730	250069	01.1867	250131	00.9978
240143	01.0761	250009	01.0857	250071	01.0213	250132	01.0906
240144	01.0258	250010	01.0175	250072	01.1471	250133	00.8240
240145	01.0808	250012	00.9592	250073	00.9366	250134	01.0515
240146	01.0028	250014	01.1362	250075	00.9196	250136	00.8113
240148	00.9133	250015	01.0110	250076	00.9252	250137	00.9043
240150	01.0321	250016	00.8832	250077	00.9839	250138	01.0222
240152	01.0496	250017	00.9173	250078	01.2721	250139	00.9424
240153	00.9800	250018	00.9533	250079	00.8424	250140	00.8235
240154	01.0122	250019	01.2459	250081	01.1195	250141	01.0266
240155	01.0116	250020	00.9580	250082	01.1345	260001	01.4589
240156	01.1273	250021	00.9246	250083	00.9045	260002	01.3391
240157	01.0952	250023	00.8811	250084	01.1159	260003	01.0516
240158	01.1434	250024	00.9447	250085	00.9619	260004	01.0523
240160	00.9795	250025	01.0577	250086	01.0453	260005	01.2179
240161	01.0583	250026	00.8543	250088	01.0483	260006	01.2818
240162	01.1388	250027	00.9231	250089	01.0233	260007	01.1638
240163	00.9595	250029	00.8903	250091	00.9572	260008	01.2590
240164	00.9585	250030	00.9184	250093	01.1505	260009	01.1722
240166	01.0583	250031	01.1550	250094	01.1677	260010	01.2130
240167	00.8933	250032	01.1833	250095	01.0669	260011	01.2887
240169	00.9798	250033	00.9449	250096	01.1525	260012	00.9580
240170	01.1096	250034	01.3063	250097	01.1120	260013	01.1531
240171	01.1122	250035	00.8840	250098	00.9073	260014	01.4968
		250036	00.9591	250099	01.1287	260015	01.0477

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
260078	01.1478	260159	01.0595	270029	01.0162	280015	01.0826	280076	00.9971
260079	01.0391	260160	01.1328	270030	00.9879	280017	01.2023	280077	01.3052
260080	01.1307	260162	01.1691	270031	00.9193	280018	00.9300	280078	01.0287
260081	01.4223	260163	01.1598	270032	01.1296	280020	01.4110	280079	00.9473
260082	01.1716	260164	01.0963	270033	00.9151	280021	01.3452	280080	01.0138
260083	01.4059	260165	01.0408	270035	01.0278	280022	01.0366	280081	01.3519
260086	01.0603	260166	01.1672	270036	00.9497	280023	01.3247	280082	00.9065
260088	01.0580	260171	00.8579	270039	01.0250	280024	00.8971	280083	01.0288
260089	01.1016	260172	01.1014	270040	01.0932	280025	01.0475	280084	00.9719
260090	01.3212	260173	01.1387	270041	00.9235	280026	01.0422	280085	01.3827
260091	01.5353	260175	01.1530	270042	01.3576	280028	00.9274	280088	01.4888
260092	01.0232	260176	01.4218	270043	00.7848	280029	01.0182	280089	00.9747
260093	00.9616	260177	01.3079	270044	00.9965	280030	01.5147	280090	01.0190
260094	01.0761	260178	01.3458	270046	00.9241	280031	01.1076	280091	01.0645
260095	01.3211	260179	01.4513	270047	00.8360	280032	01.1613	280092	00.9186
260096	01.3407	260180	01.4805	270048	00.9979	280033	00.9770	280093	00.9443
260097	01.2305	260182	01.0764	270049	01.2776	280034	01.2669	280094	00.9918
260100	01.1946	260183	01.2778	270050	00.9361	280035	01.0536	280097	00.8394
260102	01.0954	260186	01.1007	270051	01.1192	280037	01.0347	280098	01.0127
260103	01.2923	260188	01.1741	270052	00.8992	280038	01.1077	280101	00.9728
260104	01.4356	260189	01.0060	270053	00.7984	280039	01.0614	280102	00.9478
260105	01.7345	260190	01.1254	270055	00.7839	280040	01.4763	280103	00.9296
260107	01.3030	260191	01.2138	270057	01.1722	280041	01.0189	280104	01.0288
260108	01.6014	260192	00.7763	270058	00.9562	280042	01.1376	280105	01.1509
260109	00.9193	260193	01.1530	270059	00.9312	280043	00.9696	280106	01.0647
260110	01.4090	260195	01.0400	270060	00.8683	280045	01.0566	280107	01.2198
260111	01.0895	260197	01.1335	270063	00.9684	280046	01.0472	280108	01.0431
260112	01.3273	260198	01.3028	270067	00.9068	280047	01.1740	280109	00.9487
260113	01.1637	260200	01.0874	270068	00.9168	280048	01.1706	280110	01.0547
260115	01.1792	270001	00.9084	270071	00.9423	280049	01.0808	280111	01.1756
260116	01.0948	270002	01.1818	270072	00.8826	280050	01.0127	280114	00.9631
260118	01.2306	270003	01.0800	270073	01.0557	280051	01.0228	280115	01.0939
260119	01.1949	270004	01.6627	270074	00.9069	280052	01.1421	280117	01.1933
260120	01.2251	270006	01.0243	270075	00.8853	280054	01.2085	280118	01.1561
260122	01.1324	270007	00.8904	270076	00.8877	280055	00.9553	280119	00.8622
260123	00.9803	270008	00.9758	270079	00.9333	280058	01.1515	280122	00.8463
260127	01.0254	270009	00.9772	270080	01.0864	280057	01.0289	280123	01.4823
260128	01.0289	270011	01.1112	270081	00.9846	280058	01.0972	290001	01.3874
260129	01.0576	270012	01.3462	270082	00.8880	290060	01.3318	290002	01.0181
260131	01.2662	270013	01.1921	270083	01.0575	290061	01.2929	290003	01.5365
260134	01.0929	270014	01.4081	290001	01.1952	290062	01.1520	290005	01.2161
260137	01.1957	270016	00.8381	280003	01.6710	290064	01.0647	290006	01.0105
260138	01.5735	270017	01.2501	280004	01.1548	290065	01.2578	290007	01.4616
260141	01.7542	270019	00.8790	280005	01.3737	290066	01.1352	290008	01.2743
260142	01.2060	270021	01.0982	280009	01.3359	290068	00.9455	290009	01.3332
260143	01.3448	270023	01.3234	280010	01.1528	290070	00.9637	290010	01.0801
260146	00.9391	270024	00.9275	280011	01.0470	290071	00.9293	290011	01.0840
260147	01.0412	270026	00.9289	280012	01.2721	290073	01.0014	290012	01.1762
260148	00.8987	270027	01.0366	280013	01.4889	290074	01.1116	290013	00.9867
260158	01.0327	270028	01.0208	280014	01.0872	290075	01.1280	290014	00.9341

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TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1989

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
290015	00.9222	310014	01.4531	310072	01.1955	320019	01.2551	330023	01.2492
290016	01.1301	310015	01.3034	310073	01.1892	320021	01.1892	330024	01.5195
290018	00.9539	310016	01.1491	310074	01.2488	320022	01.2553	330025	01.0636
290019	01.1376	310017	01.2792	310075	01.1930	320023	01.0761	330027	01.3510
290020	01.0059	310018	01.1003	310076	01.2694	320024	01.0099	330028	01.1991
290021	01.5100	310019	01.4919	310077	01.5041	320025	00.9275	330029	01.1801
290022	01.5704	310020	01.1816	310078	01.2687	320026	00.9740	330030	01.1688
290027	01.0632	310021	01.1942	310079	01.1580	320027	01.1580	330031	01.3094
290029	00.9645	310022	01.2130	310080	01.2001	320028	00.9493	330032	01.2151
290031	00.9334	310023	01.2146	310081	01.1788	320029	01.2222	330033	01.0494
290032	01.3114	310024	01.1210	310082	01.2090	320030	01.1546	330034	01.1369
290033	01.1030	310025	01.1950	310083	01.2112	320031	01.0156	330035	01.1697
300001	01.2284	310026	01.1982	310084	01.1822	320032	01.0841	330036	01.0648
300002	01.0383	310027	01.1352	310085	01.1922	320033	00.8867	330037	01.3450
300003	01.6213	310028	01.1352	310086	01.2124	320034	00.8867	330038	01.1559
300005	01.3309	310029	01.5302	310087	01.2125	320035	00.8418	330039	01.2177
300006	01.0718	310030	02.0595	310088	01.1838	320036	00.8156	330040	01.2490
300007	01.1151	310031	01.0881	310089	01.2393	320037	00.9943	330041	01.4671
300008	01.2121	310032	01.1695	310090	01.0692	320038	00.9943	330042	01.2002
300009	01.1714	310033	01.1524	310091	01.1251	320039	01.0500	330043	01.3425
300010	01.2810	310034	01.1994	310092	01.4261	320040	00.8867	330044	01.3469
300011	01.2339	310035	01.2146	310093	01.1663	320041	01.2401	330045	01.0956
300012	01.2550	310036	01.4703	310094	01.1404	320042	01.1450	330046	01.2892
300013	01.2149	310037	01.1922	310095	01.1115	320043	01.0216	330047	01.3535
300014	01.2192	310038	01.2274	310096	01.2000	320044	01.0869	330048	01.2194
300015	01.0905	310039	01.1073	310097	01.1740	320045	01.7165	330049	01.3837
300016	01.1808	310040	01.2297	310098	01.1754	320046	01.0761	330050	01.2596
300017	01.2002	310041	01.2240	310099	01.2491	320047	01.1331	330051	01.1211
300018	01.1475	310042	01.0699	310100	01.0928	320048	00.8570	330052	01.2862
300019	01.1393	310043	01.2653	310101	01.2076	320049	01.1465	330053	01.1535
300020	01.1599	310044	01.1803	310102	01.0083	320050	01.2399	330054	01.3113
300021	01.1907	310045	01.2413	310103	01.8632	320051	01.2904	330055	01.2314
300022	01.1438	310046	01.1673	310104	00.8235	320052	01.4460	330056	01.1591
300023	01.2364	310047	01.2946	310105	01.2043	320053	01.3434	330057	01.1693
300024	01.2121	310048	01.2035	310106	01.2486	320054	01.2020	330058	01.0217
300025	01.1184	310049	01.2501	310107	01.1172	320055	01.1708	330059	01.1811
300026	01.2640	310050	01.2026	310108	01.2050	320056	01.0988	330060	01.1705
300027	01.0411	310051	01.2494	310109	01.1651	320057	01.1458	330061	01.1777
300028	01.4569	310052	01.0990	310110	01.2425	320058	01.1458	330062	01.3223
300029	01.4478	310053	00.9008	310111	00.9934	320059	01.2317	330063	01.0297
300030	01.6868	310054	01.1801	310112	00.9950	320060	01.2986	330064	01.1819
300031	01.1532	310055	01.1361	310113	00.9925	320061	01.0421	330065	01.1634
300032	01.1548	310056	01.1246	310114	00.8886	320062	01.0421	330066	01.5462
300033	01.1380	310057	01.2690	310115	01.0747	320063	01.2607	330067	01.1932
300034	01.1401	310058	01.1934	310116	01.1747	320064	01.0071	330068	01.0858
300035	01.2103	310059	01.1950	310117	01.2142	320065	01.0139		
300036	01.2154	310060	01.0753						
300037	01.2769	310061	01.2250						
300038	01.2617	310062	01.1866						

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
: CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1989

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
330094	01.2719	330167	01.3600	330231	01.1357	330316	01.2978
330095	01.2271	330168	01.0525	330232	01.1975	330320	01.1645
330096	01.0896	330169	01.2012	330233	01.3152	330327	00.9587
330097	01.1953	330171	01.2762	330234	01.7221	330331	01.1551
330100	00.5967	330174	00.9846	330235	01.1848	330332	01.1379
330101	01.4460	330175	01.0689	330236	01.3259	330333	01.1906
330102	01.1908	330176	00.8882	330238	01.1078	330335	01.1618
330103	01.1858	330177	01.1210	330239	01.1584	330336	01.1487
330104	01.2783	330179	00.9525	330240	01.1430	330338	01.1133
330105	01.5460	330180	01.2349	330241	01.6745	330339	01.0191
330107	01.1467	330181	01.2526	330242	01.2722	330340	01.0798
330108	01.2839	330182	02.0728	330244	00.9910	330350	01.6104
330110	00.9945	330183	01.3233	330245	01.2049	330351	01.1020
330111	01.1512	330184	01.2514	330246	01.1933	330353	01.1701
330114	00.9971	330185	01.1377	330247	00.5882	330354	01.0681
330115	01.1777	330186	01.1316	330249	01.1939	330357	01.2427
330116	00.9573	330188	01.1544	330250	01.1897	330359	01.0253
330118	01.4698	330189	00.8132	330252	00.9376	330362	00.6899
330119	01.2953	330191	01.2470	330254	00.9763	330363	00.7358
330120	01.6218	330193	01.3260	330257	01.0250	330366	00.7092
330121	01.0448	330194	01.4025	330258	01.2630	330367	00.6320
330122	01.1830	330195	01.4417	330259	01.1936	330368	00.6981
330125	01.5712	330196	01.2553	330261	01.2144	330369	00.7100
330126	01.1313	330197	01.0464	330263	01.0924	330371	00.7562
330127	01.2208	330198	01.2341	330264	01.1420	330372	01.2251
330128	01.2076	330199	01.1842	330265	01.2827	330373	00.6566
330132	01.0939	330201	01.3811	330267	01.1818	330381	01.1116
330133	01.2231	330202	01.1690	330268	01.1516	330383	01.2041
330135	01.1754	330203	01.3419	330270	01.8429	330385	01.2071
330136	01.3136	330204	01.1770	330272	00.9732	330386	01.1866
330140	01.5009	330205	01.1188	330273	01.1781	330387	01.0455
330141	01.2124	330208	01.1900	330275	01.2390	330389	01.7896
330142	01.1928	330209	01.1767	330276	01.2519	330390	01.1897
330144	01.0315	330210	01.0955	330277	01.1271	330391	01.4905
330148	01.0408	330211	01.1280	330279	01.2004	330393	01.4623
330151	01.1807	330212	01.0916	330281	00.7380	330394	01.2107
330152	01.3022	330213	01.1264	330285	01.4477	330395	01.2107
330153	01.2917	330214	01.5647	330286	01.1917	330396	01.3028
330154	01.3703	330215	01.2006	330288	01.0614	330397	01.1961
330155	01.1245	330217	01.1197	330289	01.6614	330398	01.2696
330157	01.2669	330218	01.2078	330291	01.1154	330399	01.1950
330158	01.2451	330219	01.3642	330293	01.1136	330399	01.2251
330159	01.3172	330221	01.2596	330297	01.1136	340001	01.2286
330160	01.2513	330222	01.1741	330304	01.1676	340002	01.6502
330161	01.0509	330223	01.1489	330306	01.1894	340003	01.1764
330162	01.2541	330224	01.2313	330307	01.2971	340004	01.3697
330163	01.1688	330225	01.2008	330308	01.1256	340005	01.2701
330164	01.3494	330226	01.2208	330309	01.1991	340006	01.0918
330165	01.0402	330229	01.2139	330314	01.2223	340007	01.1586
330166	00.9944	330230	01.3755	330315	01.1919	340008	01.0612
				330315	01.1173	340009	00.9203

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
340010	01.3177	340015	01.2415	340020	01.2056
340011	01.1068	340016	01.1898	340021	01.2942
340012	01.0685	340017	01.1909	340022	01.1426
340013	01.2343	340018	01.1899	340023	01.2903
340014	01.4451	340019	01.1235	340024	01.2224
340015	01.2415	340020	01.2056	340025	01.1187
340016	01.1898	340021	01.2942	340026	01.0012
340017	01.1909	340022	01.1426	340027	01.1494
340018	01.1899	340023	01.2903	340028	01.3159
340019	01.1235	340024	01.2224	340029	01.6488
340020	01.2056	340025	01.1187	340030	01.0472
340021	01.2942	340026	01.0012	340031	01.3302
340022	01.1426	340027	01.1494	340032	01.2800
340023	01.2903	340028	01.3159	340033	01.0812
340024	01.2224	340029	01.6488	340034	01.1235
340025	01.1187	340030	01.0472	340035	01.1828
340026	01.0012	340031	01.3302	340036	01.1628
340027	01.1494	340032	01.2800	340037	01.1941
340028	01.3159	340033	01.0812	340038	01.1870
340029	01.6488	340034	01.1235	340039	01.6306
340030	01.0472	340035	01.1828	340040	01.2132
340031	01.3302	340036	01.1628	340041	01.2633
340032	01.2800	340037	01.1941	340042	01.0186
340033	01.0812	340038	01.1870	340043	00.9925
340034	01.1235	340039	01.6306	340044	01.6050
340035	01.1828	340040	01.2132	340045	01.6112
340036	01.1628	340041	01.2633	340046	01.1864
340037	01.1941	340042	01.0186	340047	01.2635
340038	01.1870	340043	00.9925	340048	00.9839
340039	01.6306	340044	01.6050	340049	01.4538
340040	01.2132	340045	01.6112	340050	01.1382
340041	01.2633	340046	01.1864	340051	01.1812
340042	01.0186	340047	01.2635	340052	01.1592
340043	00.9925	340048	00.9839	340053	01.0492
340044	01.6050	340049	01.4538	340054	01.1592
340045	01.6112	340050	01.1382	340055	01.0327
340046	01.1864	340051	01.1812	340056	01.2316
340047	01.2635	340052	01.1592	340057	01.6220
340048	00.9839	340053	01.0492	340058	01.2488
340049	01.4538	340054	01.1592		
340050	01.1382	340055	01.0327		
340051	01.1812	340056	01.2316		
340052	01.1592	340057	01.6220		
340053	01.0492	340058	01.2488		
340054	01.1592				
340055	01.0327				
340056	01.2316				
340057	01.6220				
340058	01.2488				
340059	01.2620				
340060	01.2620				
340061	01.5457				
340062	01.0911				
340063	01.0911				
340064	01.0492				
340065	01.1592				
340066	01.0327				
340067	01.2316				
340068	01.2316				
340069	01.6220				
340070	01.2488				

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1989

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
340071	01.0065	340138	01.1107	350032	01.0077	360028	01.2009	360082	01.2475
340072	01.1262	340141	01.4100	350033	00.9001	360029	01.1108	360083	01.0960
340073	01.2619	340142	01.1780	350034	00.9724	360030	01.0821	360084	01.3321
340075	01.1741	340143	01.3117	350035	00.8314	360031	01.1770	360085	01.5024
340076	01.0829	340144	01.2140	350036	00.9750	360032	01.1472	360086	01.2106
340079	00.9839	340145	01.1947	350038	00.9280	360034	01.0676	360087	01.2342
340080	01.1210	340146	00.9652	350039	00.8993	360035	01.3807	360088	01.0393
340084	01.0871	340147	01.2244	350041	00.9877	360036	01.1465	360089	01.0922
340085	01.2156	340148	01.2614	350042	00.9563	360037	01.5464	360090	01.2110
340087	01.1159	340151	01.0962	350043	01.1504	360038	01.2910	360091	01.2639
340088	01.1335	340153	01.9135	350044	00.8903	360039	01.1942	360092	01.1543
340089	00.9783	340154	00.9245	350047	01.0149	360040	01.1333	360093	01.1354
340090	01.1653	340155	01.3579	350049	01.0129	360041	01.2226	360094	01.1923
340091	01.4730	340156	00.8746	350050	00.8586	360042	01.1865	360095	01.2252
340093	01.0329	340157	01.2375	350051	00.8543	360043	01.1313	360096	01.0630
340094	01.3680	340158	01.1222	350053	00.9632	360044	01.3485	360098	01.2726
340096	01.1446	340159	01.1740	350055	00.8615	360046	01.0785	360099	01.0628
340097	01.0539	340160	01.0662	350056	00.9211	360047	01.0517	360100	01.2954
340098	01.5589	340162	01.2620	350058	00.9663	360048	01.4283	360101	01.3169
340099	01.2436	340164	01.2395	350060	00.9323	360049	01.1561	360102	01.2298
340100	01.3713	340166	01.2609	350061	00.9804	360050	01.2727	360103	01.2727
340101	01.2988	340167	00.7110	350063	00.8494	360051	01.3724	360104	01.0156
340104	00.9835	350001	01.0572	350064	00.8751	360052	01.4292	360106	01.1498
340105	01.3209	350002	01.4201	350065	00.9899	360053	01.2340	360107	01.1017
340106	01.1703	350003	01.1801	350066	00.8965	360054	01.2353	360108	01.1293
340107	01.2525	350004	01.6341	350067	00.8274	360055	01.1796	360109	01.0847
340109	01.3208	350005	01.1784	360001	01.1534	360056	01.2089	360112	01.4145
340111	01.3284	350006	01.1588	360002	01.1331	360057	00.9999	360113	01.1892
340112	01.0746	350007	00.9519	360003	01.3071	360058	01.0916	360114	01.0466
340113	01.8346	350008	00.8962	360006	01.5396	360059	01.3029	360115	01.1244
340114	01.2747	350009	01.1546	360007	01.0556	360061	00.4262	360116	01.0650
340115	01.3273	350010	01.1125	360008	01.2000	360062	01.4391	360118	01.2229
340116	01.4720	350011	01.4848	360009	01.2073	360063	01.0015	360119	01.0923
340119	01.2552	350012	00.9552	360010	01.1242	360064	01.3362	360120	00.8457
340120	01.1186	350013	00.9824	360011	01.2695	360065	01.2061	360121	01.0776
340121	01.1097	350014	00.9535	360012	01.2656	360066	01.1662	360122	01.1994
340122	00.9904	350015	01.5266	360013	01.1245	360068	01.1817	360123	01.1336
340123	01.1826	350016	01.1029	360014	01.1998	360069	01.3169	360124	01.2787
340124	01.0834	350017	01.2443	360015	01.3839	360070	01.0604	360125	01.1276
340125	01.4517	350018	00.9584	360016	01.3244	360071	01.2386	360126	01.2067
340126	01.2829	350019	01.3772	360017	01.4946	360072	01.1860	360127	00.9921
340127	01.1842	350020	01.1791	360018	01.8064	360074	01.2325	360128	01.1389
340129	01.1830	350021	01.0109	360019	01.1515	360075	01.2416	360129	01.0374
340130	01.2787	350023	00.9478	360020	01.2086	360076	01.3274	360130	01.1309
340131	01.3150	350024	00.9724	360021	01.2218	360077	01.2013	360131	01.1670
340132	01.2319	350025	01.0111	360022	01.1452	360078	01.3392	360132	01.1513
340133	01.1049	350027	01.0132	360024	01.1277	360079	01.2486	360133	01.3562
340135	01.0090	350029	00.8758	360025	01.1022	360080	01.4643	360134	01.3689
340136	00.9386	350030	01.0977	360026	01.1017	360081	01.1690	360135	01.1027
340137	01.0904	350031	01.0236	360027	01.4239			360136	01.0476

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
: CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1989

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
360137	01.4445	360204	01.1478	370042	00.8790	370117	01.1678	380009	01.5313
360139	01.0859	360210	01.1799	370043	00.9685	370121	01.1297	380010	01.1563
360140	01.0207	360211	01.1099	370045	01.0661	370122	00.9509	380011	01.0362
360141	01.2875	360212	01.3357	370046	01.0641	370123	01.1266	380013	01.0911
360142	01.0347	360213	01.0816	370047	01.0519	370125	00.9866	380014	01.1893
360143	01.1635	360218	01.2806	370048	01.0012	370126	01.0259	380017	01.5658
360144	01.2971	360230	01.2562	370049	01.0465	370130	01.0441	380018	01.6160
360145	01.3106	360231	01.1032	370050	00.9810	370131	00.9439	380019	01.2234
360147	01.1926	360232	01.0744	370051	01.0241	370133	00.9519	380020	01.3448
360148	01.2030	360234	01.2068	370054	01.1115	370138	01.0730	380021	01.2184
360149	01.0715	360236	01.1513	370056	01.2334	370139	01.0670	380022	01.2184
360150	01.1576	360238	01.0214	370057	01.1627	370140	01.0143	380023	01.1997
360151	01.2658	360239	01.1944	370059	01.1493	370141	01.3503	380024	01.2917
360152	01.3128	360240	01.0715	370060	01.0030	370144	01.1792	380025	01.2788
360153	01.1197	360241	00.6245	370061	00.8962	370146	00.9792	380026	01.2355
360154	01.1020	370001	01.6131	370063	01.1145	370148	01.2466	380027	01.2959
360155	01.1114	370002	01.1089	370064	00.9765	370149	01.1861	380029	01.1044
360156	01.0972	370004	01.0825	370065	01.1755	370153	01.0922	380030	00.8939
360159	01.1776	370005	00.9277	370069	01.0585	370154	00.9744	380031	00.9752
360161	01.2607	370006	01.1036	370071	00.9042	370156	01.0194	380033	01.5087
360162	01.1362	370007	01.1354	370072	00.9974	370157	00.9519	380035	01.2431
360163	01.4476	370008	01.2060	370076	01.0391	370158	01.0846	380036	01.0858
360164	01.2028	370011	00.9387	370077	01.1849	370159	01.1582	380037	01.1830
360165	00.9773	370012	00.9422	370078	01.4785	370161	01.0094	380038	01.2104
360166	00.9788	370013	01.3361	370079	00.9261	370163	00.9150	380039	01.2802
360168	00.9507	370014	01.2114	370080	01.0133	370165	00.9924	380040	01.1174
360169	01.0513	370015	01.1474	370082	00.9391	370166	01.0158	380042	01.0990
360170	01.0627	370016	01.2267	370083	01.0128	370168	00.8946	380043	01.0026
360171	01.1411	370017	00.9485	370084	00.9310	370169	01.0569	380044	01.0950
360172	01.2771	370018	01.1959	370085	00.9737	370170	01.0757	380045	01.1619
360174	01.1212	370019	01.0674	370086	01.0480	370171	00.9843	380047	01.4537
360175	01.1510	370020	01.1834	370089	01.2387	370172	00.9523	380048	00.9800
360176	01.2061	370021	01.0645	370091	01.4286	370173	01.0338	380050	01.2879
360177	01.0760	370022	01.1723	370092	01.0174	370174	00.8956	380051	01.2786
360178	01.2194	370023	01.1639	370093	01.4528	370176	01.1786	380052	01.1816
360179	01.1860	370025	01.2460	370094	01.1850	370177	00.9237	380055	00.9905
360180	01.8383	370026	01.2646	370095	00.9645	370178	01.0214	380056	00.9905
360184	01.0749	370028	01.4672	370096	00.9767	370179	01.0553	380059	01.0158
360185	01.2205	370029	01.2556	370097	01.2539	370180	01.1839	380060	01.2942
360186	00.9348	370030	01.1819	370099	01.0273	370182	01.0019	380061	01.4338
360187	01.1956	370032	01.2627	370100	01.1227	370183	01.0659	380062	00.9023
360188	01.0656	370033	01.0689	370103	01.0367	370184	01.2652	380063	01.1304
360189	01.1063	370034	01.1171	370105	01.8082	380001	01.3686	380064	01.2515
360192	01.2233	370035	01.3649	370106	01.3040	380002	01.1766	380065	01.1183
360193	01.1973	370036	01.1144	370107	01.0025	380003	01.0878	380066	01.1261
360194	01.1096	370037	01.5324	370108	00.9576	380004	01.6610	380068	01.0543
360195	01.2209	370038	00.9222	370110	00.9720	380005	01.1449	380069	01.0728
360197	01.1090	370039	01.1497	370112	00.9919	380006	01.1643	380070	01.0106
360200	01.1491	370040	01.1098	370113	01.1604	380007	01.5342	380071	01.2195
360203	01.1271	370041	00.9861	370114	01.4606	380008	01.1378	380072	00.8791

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
380075	01.2605	390039	01.0932	390095	01.2483	390154	01.1076	390213	01.0096
380077	00.9016	390040	01.0468	390096	01.2145	390155	01.2901	390215	01.1651
380078	01.1324	390041	01.1317	390097	01.3468	390156	01.2487	390217	01.0763
380079	01.1381	390042	01.1914	390098	01.5562	390157	01.1680	390219	01.1984
380081	00.9754	390043	01.0434	390100	01.5892	390158	01.2594	390220	01.2065
380082	01.2092	390044	01.4258	390101	01.2121	390159	01.1823	390222	01.2305
380083	01.1119	390045	01.2396	390102	01.2246	390160	01.1428	390223	01.5457
380084	01.4275	390046	01.3569	390103	01.0904	390161	01.0759	390224	00.9392
380087	01.0093	390047	01.4004	390104	01.1416	390162	01.1738	390225	01.1799
380088	01.0713	390048	01.1501	390105	01.0130	390163	01.1647	390226	01.4793
380089	01.2662	390049	01.3262	390107	01.1658	390164	01.5181	390228	01.2149
380090	01.3393	390050	01.7372	390108	01.2403	390165	01.1400	390229	01.3260
380091	01.2188	390051	01.9545	390109	01.2559	390166	01.0894	390231	01.2674
380094	01.1119	390052	01.0669	390110	01.1732	390167	01.1948	390232	01.0583
390001	01.1223	390054	01.1907	390111	01.6401	390168	01.1537	390233	01.1537
390002	01.2239	390055	01.4745	390112	01.1378	390169	01.2107	390234	01.3283
390003	01.1085	390056	01.1356	390113	01.1736	390170	01.5511	390235	01.6045
390004	01.2565	390057	01.2496	390114	01.0281	390171	01.0614	390236	01.0833
390005	01.1100	390058	01.2720	390115	01.2370	390172	01.1250	390237	01.4369
390006	01.4926	390059	01.4112	390116	01.1935	390173	01.0968	390238	00.8379
390007	01.1705	390060	01.1843	390117	01.0749	390174	01.4980	390242	01.1886
390008	01.1562	390061	01.2265	390118	01.1373	390176	01.1054	390244	00.9405
390009	01.3479	390062	01.1187	390119	01.2176	390178	01.3301	390245	01.2478
390010	01.0985	390063	01.4816	390121	01.1837	390179	01.2140	390246	01.1126
390011	01.1874	390064	01.3125	390122	01.0940	390180	01.2807	390247	01.0552
390012	01.2118	390065	01.1933	390123	01.1994	390181	01.0818	390249	01.0604
390013	01.1793	390066	01.2193	390125	01.1684	390183	01.0689	390252	00.8870
390014	00.8572	390067	01.4933	390126	01.2058	390184	01.0951	390256	01.5671
390015	01.1282	390068	01.2839	390127	01.1344	390185	01.1709	390258	01.1628
390016	01.1163	390069	01.1629	390128	01.1149	390186	01.1193	390260	01.2531
390017	01.0695	390070	01.1327	390130	01.0023	390187	01.1546	390261	01.6843
390018	01.1796	390071	01.1089	390131	01.2124	390188	01.0672	390262	01.3949
390019	01.0854	390072	00.9864	390132	01.0019	390189	01.0655	390263	01.4805
390020	01.2760	390073	01.1963	390133	01.3347	390191	01.1248	390265	01.2555
390021	01.0647	390074	01.1652	390135	01.2726	390192	01.0615	390266	01.1367
390022	01.1081	390075	01.2700	390136	01.1965	390193	01.1713	390267	01.1539
390023	01.1943	390076	01.2237	390137	01.0944	390194	01.0681	390268	01.1427
390024	00.7158	390077	01.2891	390138	01.2488	390195	01.3574	390270	01.2261
390025	00.6763	390078	01.0861	390139	01.4397	390196	01.1390	390272	00.6141
390026	01.2193	390079	01.6124	390142	01.5239	390197	01.2568	390275	00.5219
390027	01.5544	390080	01.1792	390143	00.9163	390198	01.2441	390276	01.1254
390028	01.5855	390081	01.1880	390145	01.1799	390199	01.2416	390277	01.1756
390029	01.4955	390083	01.1955	390146	01.1277	390200	01.0178	390278	01.3306
390030	01.1254	390084	01.1488	390147	01.1516	390201	01.3304	400001	01.1554
390031	01.1550	390086	01.1445	390148	01.0722	390203	01.2681	400002	01.2881
390032	01.1546	390088	01.3184	390149	01.2052	390204	01.1750	400003	01.1416
390034	01.0873	390090	01.5500	390150	01.1239	390205	01.1574	400004	01.1215
390035	01.3011	390091	01.1455	390151	01.1988	390206	01.2300	400005	01.0700
390036	01.2677	390092	01.1482	390152	01.0642	390209	01.0371	400006	01.2031
390037	01.1917	390093	01.1191	390153	01.1720	390211	01.1670	400007	01.1118

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CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
400008	01.1208	400119	01.1743	420048	01.0320	430018	00.9465	440002	01.3394
400009	00.9595	410001	01.1909	420049	01.1222	430020	01.0657	440003	01.1015
400010	01.0626	410002	01.1517	420050	00.9860	430022	00.9338	440005	00.9542
400011	01.0981	410004	01.12985	420051	01.4450	430023	00.9398	440006	01.2204
400012	00.9818	410005	01.2579	420053	01.1117	430024	01.0622	440007	00.9796
400013	00.9262	410006	01.2303	420054	01.1211	430025	00.9305	440008	01.0251
400014	01.3371	410007	01.4260	420055	01.1230	430026	01.0065	440009	00.9738
400015	01.0958	410008	01.0862	420056	01.1045	430027	01.5974	440010	00.9949
400016	01.2577	410009	01.2105	420057	01.2098	430028	00.9756	440011	01.2391
400017	01.0372	410010	00.9837	420059	01.0652	430029	00.9819	440012	01.2205
400018	01.0846	410011	01.1692	420061	01.1724	430030	01.0189	440014	00.9314
400019	01.1651	410012	01.3775	420062	01.0677	430031	00.9479	440015	01.3950
400021	01.3341	410013	01.1471	420064	01.0728	430033	01.0362	440016	00.9782
400022	01.2422	410014	01.1269	420065	01.2914	430034	01.0722	440017	01.2530
400023	00.5382	410016	01.0001	420066	00.9648	430036	01.0793	440018	01.1630
400024	01.1138	420002	01.2692	420067	01.1587	430037	00.9304	440019	01.4245
400026	01.0128	420003	01.1183	420068	01.2248	430038	01.0431	440020	01.0253
400027	01.0873	420004	01.7415	420069	01.1294	430039	01.0626	440022	01.0752
400028	01.0369	420005	01.0502	420070	01.2584	430040	00.9362	440023	00.9228
400029	01.1085	420006	01.2321	420071	01.2145	430041	01.0674	440024	01.1108
400031	00.9623	420007	01.4340	420072	00.9409	430042	00.9824	440025	01.0685
400032	01.2361	420009	01.2086	420073	01.2557	430043	01.0422	440026	01.1559
400037	00.9891	420010	01.0785	420074	01.0075	430044	00.8694	440029	01.2044
400036	01.1497	420011	01.0664	420075	01.0104	430047	01.1749	440030	01.0481
400044	01.0639	420014	01.0679	420076	01.0749	430048	01.0599	440031	01.0167
400048	01.1230	420015	01.1400	420078	01.3824	430049	00.9637	440032	00.9803
400061	01.4333	420016	01.1706	420079	01.3738	430051	00.9062	440033	01.0581
400079	01.0895	420017	01.0401	420080	01.2434	430054	00.9285	440034	01.2654
400083	00.9053	420018	01.5070	420081	01.0235	430056	00.9877	440035	01.1520
400087	01.2332	420019	01.2001	420082	01.3537	430057	00.9244	440038	00.9416
400088	00.8380	420020	01.1802	420083	01.1735	430060	01.0642	440039	01.4746
400089	01.0847	420022	01.2079	420084	00.6700	430062	00.9005	440040	00.9779
400090	01.1710	420023	01.2600	420085	01.2739	430064	01.0470	440041	00.9157
400094	01.0558	420026	01.7561	420086	01.2008	430065	00.9846	440045	00.9745
400098	01.0228	420027	01.1283	420087	01.3575	430066	01.0061	440047	00.9181
400102	01.1516	420028	01.0282	420088	01.1590	430072	01.1529	440048	01.3318
400103	01.4508	420029	01.4459	420089	01.1700	430073	01.0725	440049	01.4217
400104	01.1099	420030	01.1539	430004	01.0430	430076	01.0196	440050	01.0667
400106	01.0074	420031	00.8987	430005	01.1935	430077	01.3034	440051	01.0038
400109	01.0811	420032	00.9225	430007	01.0621	430079	01.0118	440052	00.9128
400110	01.1512	420033	01.2305	430008	01.2125	430080	00.9624	440053	01.1780
400111	01.1180	420036	00.7801	430009	01.0608	430081	01.0234	440054	00.9484
400112	01.1919	420037	01.2174	430010	00.9798	430082	00.8708	440055	01.1313
400113	01.0993	420038	01.0682	430011	01.2607	430083	00.8727	440056	00.9374
400114	01.0391	420039	01.0992	430012	01.2179	430084	00.8902	440057	00.9436
400115	01.0314	420040	01.3275	430013	01.1411	430085	00.9072	440058	01.0578
400116	01.1152	420042	01.0776	430014	01.3188	430086	00.8754	440059	01.0731
400117	01.1323	420043	01.1569	430015	01.0512	430087	00.8299	440060	01.0326
400118	01.0530	420044	01.1773	430016	01.3676	430088	01.1009	440061	01.1467
				430017	01.1147	440001	01.0234	440063	01.1814

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: CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1980

[illegible]

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
 : CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1988

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PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
450696	01.1247	460005	01.2591	470020	00.9840	490059	01.2705
450697	01.3527	460006	01.2581	470023	01.2344	490060	01.0060
450698	00.8414	460007	01.1767	470024	01.1370	490063	01.4075
450700	00.9730	460008	01.2851	490001	01.0161	490066	01.0809
450702	01.2408	460009	01.5178	490002	00.9415	490067	01.1224
450703	01.1226	460010	01.7501	490003	00.6947	490069	01.1850
450704	01.1948	460011	01.2045	490004	01.1720	490071	01.1472
450705	00.9639	460012	01.4481	490005	01.2361	490073	01.1579
450706	01.1832	460013	01.4276	490006	01.1853	490074	01.2468
450709	01.1300	460014	01.1781	490008	01.6107	490075	01.2049
450710	00.5681	460015	01.1917	490009	01.0358	490077	01.1490
450711	01.4647	460016	00.9409	490009	01.5393	490078	00.8858
450712	00.7111	460017	01.2914	490010	01.2076	490079	01.1414
450713	01.2356	460018	00.9071	490011	01.2034	490083	00.7229
450715	01.2627	460019	01.0779	490012	01.0939	490084	01.1119
450716	01.1328	460020	00.8948	490013	01.0985	490085	01.0206
450717	01.2811	460021	01.2538	490014	01.4124	490088	01.1483
450718	01.1080	460022	00.9685	490015	01.2550	490089	01.0015
450719	01.1367	460023	01.1293	490017	01.2722	490090	01.1674
450722	00.9315	460024	00.8805	490018	01.1031	490091	01.2350
450723	01.3556	460025	00.9890	490019	01.1452	490092	01.0768
450724	01.3073	460026	01.0070	490020	01.0687	490093	01.2400
450725	00.8773	460027	00.9124	490021	01.0937	490094	01.0663
450726	01.0021	460029	00.8758	490022	01.2163	490095	01.2197
450727	01.0740	460030	01.0277	490023	01.1242	490097	01.0905
450728	01.0158	460032	00.9486	490024	01.4301	490098	01.2437
450729	00.8320	460033	00.9121	490027	01.0821	490099	01.0632
450730	01.3287	460035	00.9386	490028	01.1483	490100	01.2411
450732	01.0330	460036	00.9848	490029	01.0555	490101	01.0744
450733	01.2150	460037	00.9631	490030	01.2681	490104	00.8440
450734	01.1184	460041	01.1890	490032	01.6151	490106	00.9368
450735	00.8393	460042	01.3061	490033	01.2038	490107	01.1990
450737	00.8470	460044	01.1606	490035	01.1024	490108	00.9628
450740	01.1782	460046	01.2615	490037	01.1258	490109	00.8214
450742	01.2326	460047	01.4768	490038	01.1710	490110	01.0849
450743	01.2307	460048	01.1731	490040	01.1873	490111	01.0860
450744	01.0571	460049	01.6504	490041	01.1146	490112	01.3922
450745	00.9790	460053	01.6504	490042	01.1805	490113	01.1487
450746	01.1123	460054	01.1518	490043	01.1804	490114	01.0546
450747	00.9454	460055	01.2575	490044	01.2035	490115	01.1527
450748	01.1066	460056	01.2205	490045	01.1783	490116	01.0486
450749	00.9606	460058	01.1695	490046	01.2434	490117	01.0594
450750	00.9606	460059	01.0747	490047	01.1912	490118	01.4869
450751	01.2410	460060	01.2150	490048	01.2140	490119	01.2300
450752	01.3436	460061	01.2342	490050	01.1853	490120	01.2615
450753	00.9600	460062	01.0985	490052	01.3252	490122	01.1537
450754	01.1419	460063	01.1980	490053	01.2096	490123	01.0791
460001	01.5623	460064	01.0633	490054	01.1254	490124	01.2468
460003	01.4735	460065	01.0305	490057	01.2201	490125	00.9664
460004	01.5081						

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CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX	PROVIDER	CASE MIX
500055	01.1404	500132	00.9356	510059	00.7881	520031	01.1429	520096	01.1635
500057	01.1427	500134	00.9788	510060	01.1315	520032	01.2337	520097	01.2435
500058	01.2472	500135	01.1740	510061	01.0151	520033	01.2087	520098	01.5493
500059	01.2490	500138	01.9087	510062	01.1125	520034	01.2552	520100	01.1312
500060	01.1067	500139	01.2112	510063	01.2137	520035	01.1849	520101	01.1285
500061	01.1352	500140	00.9230	510064	01.1921	520037	01.5513	520102	01.1042
500062	01.0376	500141	01.2584	510065	01.0192	520038	01.2741	520103	01.2674
500064	01.4094	510001	01.3327	510066	01.1348	520039	01.0462	520104	00.9350
500065	01.1890	510002	01.1583	510067	01.1703	520040	01.0963	520107	01.1931
500066	01.0097	510004	00.9872	510068	01.2122	520041	01.2840	520109	01.0340
500068	01.0452	510005	00.9298	510070	01.1241	520042	01.0753	520110	00.9842
500069	01.1436	510006	01.2578	510071	01.2935	520043	01.5259	520111	01.0842
500071	01.1929	510007	01.2583	510072	01.0935	520044	01.3066	520112	01.1882
500072	01.1929	510008	01.1631	510074	00.9719	520045	00.9802	520113	01.1025
500073	01.1040	510009	01.1226	510076	00.9443	520047	00.9802	520114	01.1911
500074	01.1226	510011	00.9275	510077	01.0195	520048	01.3295	520115	01.1911
500075	01.1994	510012	01.0788	510078	00.9098	520049	01.6291	520116	01.2008
500076	01.2577	510013	01.1959	510081	00.9098	520051	01.7015	520117	01.0381
500077	01.2317	510014	01.1227	510082	00.9619	520053	01.0529	520118	00.9271
500078	01.2997	510015	00.9666	510084	00.9684	520054	01.1315	520120	01.0187
500079	01.3323	510016	00.9795	510085	01.1916	520056	01.0622	520121	01.0265
500080	01.0415	510018	01.1568	510086	00.9982	520057	01.0562	520122	00.9646
500084	01.0454	510019	00.8450	510088	01.2002	520058	01.0562	520123	01.0405
500085	01.0106	510020	01.0276	510091	01.2686	520059	01.2495	520124	01.1227
500086	01.3021	510022	01.4281	510093	01.1570	520060	01.1794	520126	00.9422
500087	01.2277	510023	01.0256	510094	01.2580	520062	01.2403	520127	00.8891
500088	01.3410	510024	01.2139	510095	01.0764	520063	01.2331	520130	00.9935
500089	01.0765	510025	00.9525	510096	01.0764	520064	01.4111	520131	01.1100
500090	00.8102	510026	00.9751	510097	01.0425	520066	01.1942	520132	01.2245
500092	01.0683	510027	01.1057	510099	01.3080	520068	00.9969	520134	01.0429
500093	01.1752	510028	01.1472	510010	01.1251	520069	01.2731	520135	00.9672
500094	01.2375	510029	01.2053	510011	01.1111	520070	01.2983	520136	01.3792
500095	01.0732	510029	01.0877	510012	01.0168	520071	01.0943	520138	01.6006
500097	01.0870	510030	01.2118	510013	01.2143	520074	01.0752	520139	01.2557
500098	00.9185	510031	01.2082	510014	01.2033	520075	01.2866	520140	01.3364
500100	00.9420	510033	00.9859	510015	01.2422	520076	01.2018	520141	01.0159
500101	01.0243	510035	00.9859	510016	01.0360	520077	01.0219	520142	00.9592
500102	00.9194	510036	01.1424	510017	01.1211	520078	01.2643	520143	00.9658
500104	01.2074	510038	01.1180	510018	01.1239	520081	01.2130	520144	01.0215
500106	00.9988	510039	01.1523	510019	01.2157	520082	01.2135	520145	01.0605
500107	01.1085	510040	00.9844	510020	01.3702	520083	01.4231	520146	01.1166
500108	01.6258	510043	01.0624	510022	01.3702	520084	01.0762	520148	01.1397
500110	01.1993	510045	00.9200	510024	00.9047	520085	01.3960	520149	01.1609
500114	01.2725	510046	01.3013	510025	00.9507	520087	01.1734	520151	00.9809
500118	01.2135	510047	01.1466	510026	01.1095	520088	01.3051	520152	01.1183
500119	01.3155	510048	01.1186	510028	01.0568	520089	01.1266	520153	01.0144
500122	01.2703	510050	01.2085	510029	01.1930	520090	01.3568	520154	01.1251
500123	00.9195	510053	00.9948	510030	01.3302	520091	01.1371	520155	01.1445
500124	01.2461	510054	00.9631	510032	00.9203	520092	01.1770	520156	01.0194
500125	01.1877	510055	01.1603	510033	01.4113	520094	01.2184	520157	01.0194
500129	01.5829	510058	01.2043	520030	01.4113	520095	01.2184	520157	01.0194

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
; CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 3C : HOSPITAL CASE MIX INDEXES FOR DISCHARGES OCCURRING IN FEDERAL FISCAL YEAR 1989

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PROVIDER CASE MIX

PROVIDER CASE MIX

PROVIDER CASE MIX

PROVIDER CASE MIX

PROVIDER CASE MIX

520159	00.9510
520160	01.6802
520161	01.0789
520167	01.2024
520170	01.1597
520171	00.9004
520173	01.0720
520174	01.3501
520175	00.7845
520176	01.0479
520177	01.3435
520178	01.2202
520180	00.8769
520182	00.5903
520184	00.5303
520185	00.7785
530001	01.0697
530002	01.1829
530003	00.9011
530004	01.0615
530005	01.0553
530006	01.0747
530007	01.1911
530008	01.0528
530009	01.0299
530010	01.1765
530011	01.1985
530012	01.4532
530014	01.1365
530015	01.1031
530016	01.1550
530017	00.9712
530019	01.0479
530019	00.9129
530022	01.0234
530023	00.8912
530024	01.0850
530025	01.2335
530026	01.0530
530027	00.9366
530029	01.0747
530031	00.9318

NOTE: CASE MIX INDEXES DO NOT INCLUDE DISCHARGES FROM PPS-EXEMPT UNITS.
 : CASE MIX INDEXES INCLUDE CASES RECEIVED IN HCFA CENTRAL OFFICE THROUGH JUNE 1989.

TABLE 4A.—WAGE INDEX FOR URBAN AREAS

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Abilene, TX.....	0.8833
Taylor, TX.....	
Aguadilla, PR.....	0.4591
Aguada, PR.....	
Aguadilla, PR.....	
Isabella, PR.....	
Moca, PR.....	
Akron, OH.....	0.9620
Portage, OH.....	
Summit, OH.....	
Albany, GA.....	0.7791
Dougherty, GA.....	
Lee, GA.....	
Albany-Schenectady-Troy, NY.....	0.8697
Albany, NY.....	
Greene, NY.....	
Montgomery, NY.....	
Rensselaer, NY.....	
Saratoga, NY.....	
Schenectady, NY.....	
Albuquerque, NM.....	0.9949
Bernalillo, NM.....	
Alexandria, LA.....	0.8468
Rapides, LA.....	
Allentown-Bethlehem, PA-NJ.....	0.9873
Warren, NJ.....	
Carbon, PA.....	
Lehigh, PA.....	
Northampton, PA.....	
Altoona, PA.....	0.9513
Blair, PA.....	
Amarillo TX.....	0.9589
Potter, TX.....	
Randall, TX.....	
*Anaheim-Santa Ana, CA.....	1.2181
Orange, CA.....	
Anchorage, AK.....	1.4320
Anchorage, AK.....	
Anderson, IN.....	0.9149
Madison, IN.....	
Anderson, SC.....	0.7799
Anderson, SC.....	
Ann Arbor, MI.....	1.1580
Washtenaw, MI.....	
Anniston, AL.....	0.7673
Calhoun, AL.....	
Appleton-Oshkosh-Neenah, WI.....	0.9512
Calumet, WI.....	
Outagamie, WI.....	
Winnebago, WI.....	
Arecibo, PR.....	0.4370
Arecibo, PR.....	
Camuy, PR.....	
Hatillo, PR.....	
Quebradillas, PR.....	
Asheville, NC.....	0.8672
Buncombe, NC.....	
Athens, GA.....	0.7719
Clarke, GA.....	
Jackson, GA.....	
Madison, GA.....	
Oconee, GA.....	
*Atlanta, GA.....	0.9293
Barrow, GA.....	
Butts, GA.....	
Cherokee, GA.....	
Clayton, GA.....	
Cobb, GA.....	
Coweta, GA.....	

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
De Kalb, GA.....	
Douglas, GA.....	
Fayette, GA.....	
Forsyth, GA.....	
Fulton, GA.....	
Gwinnett, GA.....	
Henry, GA.....	
Newton, GA.....	
Paulding, GA.....	
Rockdale, GA.....	
Spalding, GA.....	
Walton, GA.....	
Atlantic City, NJ.....	0.9849
Atlantic, NJ.....	
Cape May, NJ.....	
Augusta, GA-SC.....	0.8777
Columbia, GA.....	
McDuffie, GA.....	
Richmond, GA.....	
Aiken, SC.....	
Aurora-Elgin, IL.....	0.9879
Kane, IL.....	
Kendall, IL.....	
Austin, TX.....	1.0294
Hays, TX.....	
Travis, TX.....	
Williamson, TX.....	
Bakersfield, CA.....	1.0878
Kern, CA.....	
*Baltimore, MD.....	0.9864
Anne Arundel, MD.....	
Baltimore, MD.....	
Baltimore City, MD.....	
Carroll, MD.....	
Harford, MD.....	
Howard, MD.....	
Queen Annes, MD.....	
Bangor, ME.....	0.9043
Penobscot, ME.....	
Baton Rouge, LA.....	0.9556
Ascension, LA.....	
East Baton Rouge, LA.....	
Livingston, LA.....	
West Baton Rouge, LA.....	
Battle Creek, MI.....	0.9641
Calhoun, MI.....	
Beaumont-Port Arthur, TX.....	0.9457
Hardin, TX.....	
Jefferson, TX.....	
Orange, TX.....	
Beaver County, PA.....	1.0454
Beaver, PA.....	
Bellingham, WA.....	1.0845
Whatcom, WA.....	
Benton Harbor, MI.....	0.8482
Berrien, MI.....	
*Bergen-Passaic, NJ.....	1.0484
Bergen, NJ.....	
Passaic, NJ.....	
Billings, MT.....	0.9682
Yellowstone, MT.....	
Biloxi-Gulfport, MS.....	0.8031
Hancock, MS.....	
Harrison, MS.....	
Binghamton, NY.....	0.9213
Broome, NY.....	
Tioga, NY.....	
Birmingham, AL.....	0.9352
Blount, AL.....	
Jefferson, AL.....	
Saint Clair, AL.....	

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Shelby, AL.....	
Walker, AL.....	
Bismarck, ND.....	0.9270
Burleigh, ND.....	
Morton, ND.....	
Bloomington, IN.....	0.9112
Monroe, IN.....	
Bloomington-Normal, IL.....	0.9656
McLean, IL.....	
Boise City, ID.....	1.0168
Ada, ID.....	
*Boston-Lawrence-Salem-Lowell- Brockton, MA.....	1.0813
Essex, MA.....	
Middlesex, MA.....	
Norfolk, MA.....	
Plymouth, MA.....	
Suffolk, MA.....	
Boulder-Longmont, CO.....	1.0771
Boulder, CO.....	
Bradenton, FL.....	0.8932
Manatee, FL.....	
Brazoria, TX.....	0.8767
Brazoria, TX.....	
Bremerton, WA.....	0.9573
Kitsap, WA.....	
Bridgeport-Stamford-Norwalk- Danbury, CT.....	1.1306
Fairfield, CT.....	
Brownsville-Harlingen, TX.....	0.8696
Cameron, TX.....	
Bryan-College Station, TX.....	0.9740
Brazos, TX.....	
Buffalo, NY.....	0.9395
Erie, NY.....	
Burlington, NC.....	0.7634
Alamance, NC.....	
Burlington, VT.....	0.9391
Chittenden, VT.....	
Grand Isle, VT.....	
Caguas, PR.....	0.3973
Caguas, PR.....	
Gurabo, PR.....	
San Lorenz, PR.....	
Agua Buenas, PR.....	
Cayey, PR.....	
Cidra, PR.....	
Canton, OH.....	0.8903
Carroll, OH.....	
Stark, OH.....	
Casper, WY.....	0.9277
Natrona, WY.....	
Cedar Rapids, IA.....	0.8910
Linn, IA.....	
Champaign-Urbana-Rantoul, IL.....	0.8904
Champaign, IL.....	
Charleston, SC.....	0.8542
Berkeley, SC.....	
Charleston, SC.....	
Dorchester, SC.....	
Charleston, WV.....	0.9647
Kanawha, WV.....	
Putnam, WV.....	
*Charlotte-Gastonia-Rock Hill, NC-SC.....	0.8373
Cabarrus, NC.....	
Gaston, NC.....	
Lincoln, NC.....	
Mecklenburg, NC.....	
Rowan, NC.....	
Union, NC.....	
York, SC.....	
Charlottesville VA.....	0.8845

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Albermarle, VA	
Charlottesville City, VA	
Fluvanna, VA	
Greene, VA	
Chattanooga, TN-GA	0.8881
Catoosa, GA	
Dade, GA	
Walker, GA	
Hamilton, TN	
Marion, TN	
Sequatchie, TN	
Cheyenne, WY	0.8786
Laramie, WY	
*Chicago, IL	1.0843
Cook, IL	
Du Page, IL	
McHenry, IL	
Chico, CA	1.0550
Butte, CA	
*Cincinnati, OH-KY-IN	1.0236
Dearborn, IN	
Boone, KY	
Campbell, KY	
Kenton, KY	
Clermont, OH	
Hamilton, OH	
Warren, OH	
Clarksville-Hopkinsville, TN-KY	0.7269
Christian, KY	
Montgomery, TN	
*Cleveland, OH	1.0765
Cuyahoga, OH	
Geauga, OH	
Lake, OH	
Medina, OH	
Colorado Springs, CO	1.0256
El Paso, CO	
Columbia, MO	1.0378
Boone, MO	
Columbia, SC	0.8444
Lexington, SC	
Richland, SC	
Columbus, GA-AL	0.7347
Russell, AL	
Chattanooga, GA	
Muscogee, GA	
*Columbus, OH	0.9472
Delaware, OH	
Fairfield, OH	
Franklin, OH	
Licking, OH	
Madison, OH	
Pickaway, OH	
Union, OH	
Corpus Christi, TX	0.8285
Nueces, TX	
San Patricio, TX	
Cumberland, MD-WV	0.9122
Allegany, MD	
Mineral, WV	
*Dallas, TX	1.0143
Collin, TX	
Dallas, TX	
Denton, TX	
Ellis, TX	
Kaufman, TX	
Rockwall, TX	
Danville, VA	0.7629
Danville City, VA	
Pittsylvania, VA	
Davenport-Rock Island-Moline, IA-IL	0.9446
Scott, IA	
Henry, IL	
Rock Island, IL	
Dayton-Springfield, OH	0.9918

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Clark, OH	
Greene, OH	
Miami, OH	
Montgomery, OH	
Daytona Beach, FL	0.8487
Volusia, FL	
Decatur, AL	0.7086
Lawrence, AL	
Morgen, AL	
Decatur, IL	0.8903
Macon, IL	
*Denver, CO	1.1756
Adams, CO	
Arapahoe, CO	
Denver, CO	
Douglas, CO	
Jefferson, CO	
Des Moines, IA	0.9711
Dallas, IA	
Polk, IA	
Warren, IA	
*Detroit, MI	1.0784
Lapeer, MI	
Livingston, MI	
Macomb, MI	
Monroe, MI	
Oakland, MI	
Saint Clair, MI	
Wayne, MI	
Dothan, AL	0.7892
Dale, AL	
Houston, AL	
Dubuque, IA	0.9456
Dubuque, IA	
Duluth, MN-WI	0.9603
St. Louis, MN	
Douglas, WI	
Eau Claire, WI	0.8666
Chippewa, WI	
Eau Claire, WI	
El Paso, TX	0.8888
El Paso, TX	
Elkhart-Goshen, IN	0.9197
Elkhart, IN	
Elmira, NY	0.9134
Chemung, NY	
Enid, OK	0.9150
Garfield, OK	
Erie, PA	0.9568
Erie, PA	
Eugene-Springfield, OR	1.0199
Lane, OR	
Evansville, IN-KY	1.0302
Posey, IN	
Vanderburgh, IN	
Warrick, IN	
Henderson, KY	
Fargo-Moorhead, ND-MN	1.0040
Clay, MN	
Cass, ND	
Fayetteville, NC	0.8158
Cumberland, NC	
Fayetteville-Springdale, AR	0.7383
Washington, AR	
Flint, MI	1.1653
Genesee, MI	
Florence, AL	0.7090
Colbert, AL	
Lauderdale, AL	
Florence, SC	0.7704
Florence, SC	
Fort Collins-Loveland, CO	1.0292
Larimer, CO	
*Fort Lauderdale-Hollywood-Pompano Beach, FL	1.0258

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Broward, FL	
Fort Myers-Cape Coral, FL	0.9003
Lee, FL	
Fort Pierce, FL	1.0400
Martin, FL	
St. Lucie, FL	
Fort Smith, AR-OK	0.8748
Crawford, AR	
Sebastian, AR	
Sequoyah, OK	
Fort Walton Beach, FL	0.8182
Okaloosa, FL	
Fort Wayne, IN	0.9008
Allen, IN	
De Kalb, IN	
Whitley, IN	
*Fort Worth-Arlington, TX	0.9544
Johnson, TX	
Parker, TX	
Tarrant, TX	
Fresno, CA	1.1137
Fresno, CA	
Gadsden, AL	0.8523
Etowah, AL	
Gainesville, FL	0.8728
Alachua, FL	
Bradford, FL	
Galveston-Texas City, TX	1.0820
Galveston, TX	
Gary-Hammond, IN	1.0493
Lake, IN	
Porter, IN	
Glens Falls, NY	0.8736
Warren, NY	
Washington, NY	
Grand Forks, ND	0.9628
Grand Forks, ND	
Grand Rapids, MI	1.0076
Kent, MI	
Ottawa, MI	
Great Falls, MT	0.9839
Cascade, MT	
Greeley, CO	1.0215
Weld, CO	
Green Bay, WI	0.9662
Brown, WI	
Greensboro-Winston-Salem-High Point, NC	0.8558
Davidson, NC	
Davie, NC	
Forsyth, NC	
Guilford, NC	
Randolph, NC	
Stokes, NC	
Yadkin, NC	
Greenville-Spartanburg, SC	0.9322
Greenville, SC	
Pickens, SC	
Spartanburg, SC	
Hagerstown, MD	0.8716
Washington, MD	
Hamilton-Middletown, OH	0.9681
Butler, OH	
Harrisburg-Lebanon-Carlisle, PA	1.0515
Cumberland, PA	
Dauphin, PA	
Lebanon, PA	
Perry, PA	
*Hartford-Middletown-New Britain-Bristol, CT	1.0995
Hartford, CT	
Litchfield, CT	
Middlesex, CT	
Tolland, CT	
Hickory, NC	0.8213

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Alexander, NC	
Burke, NC	
Catawba, NC	
Honolulu, HI	1.1365
Honolulu, HI	
Houma-Thibodaux, LA	0.7485
Lafourche, LA	
Terrebonne, LA	
*Houston, TX	0.9868
Fort Bend, TX	
Harris, TX	
Liberty, TX	
Montgomery, TX	
Waller, TX	
Huntington-Ashland, WV-KY-OH	0.9177
Boyd, KY	
Carter, KY	
Greenup, KY	
Lawrence, OH	
Cabell, WV	
Wayne, WV	
Huntsville, AL	0.8260
Madison, AL	
*Indianapolis, IN	0.9903
Boone, IN	
Hamilton, IN	
Hancock, IN	
Hendricks, IN	
Johnson, IN	
Marion, IN	
Morgan, IN	
Shelby, IN	
Iowa City, IA	1.0951
Johnson, IA	
Jackson, MI	0.9283
Jackson, MI	
Jackson, MS	0.8075
Hinds, MS	
Madison, MS	
Rankin, MS	
Jackson, TN	0.7560
Madison, TN	
Jacksonville, FL	0.8920
Clay, FL	
Duval, FL	
Nassau, FL	
St. Johns, FL	
Jacksonville, NC	0.7219
Onslow, NC	
Jamestown-Dunkirk, NY	0.7963
Chatauqua, NY	
Janesville-Beloit, WI	0.8999
Rock, WI	
Jersey City, NJ	1.0737
Hudson, NJ	
Johnson City-Kingsport-Bristol, TN-VA	0.8773
Carter, TN	
Hawkins, TN	
Sullivan, TN	
Unicoi, TN	
Washington, TN	
Bristol City, VA	
Scott, VA	
Washington, VA	
Johnstown, PA	0.9149
Cambria, PA	
Somerset, PA	
Joliet, IL	1.0421
Grundy, IL	
Will, IL	
Joplin, MO	0.8635
Jasper, MO	
Newton, MO	
Kalamazoo, MI	1.1089

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Kalamazoo, MI	
Kankakee, IL	0.9024
Kankakee, IL	
*Kansas City, KS-MO	1.0093
Johnson, KS	
Leavenworth, KS	
Miami, KS	
Wyandotte, KS	
Cass, MO	
Clay, MO	
Jackson, Mo	
Lafayette, MO	
Platte, MO	
Ray, MO	
Kenosha, WI	1.0527
Kenosha, WI	
Killeen-Temple, TX	1.1227
Beil, TX	
Coryell, TX	
Knoxville, TN	0.8202
Anderson, TN	
Blount, TN	
Grainger, TN	
Jefferson, TN	
Knox, TN	
Sevier, TN	
Union, TN	
Kokomo, IN	0.9410
Howard, IN	
Tipton, IN	
LaCrosse, WI	0.9666
LaCrosse, WI	
Lafayette, LA	0.9003
Lafayette, LA	
St. Martin, LA	
Lafayette, IN	0.8843
Tippecanoe, IN	
Lake Charles, LA	0.8900
Calcasieu, LA	
Lake County, IL	1.0354
Lake, IL	
Lakeland-Winter Haven, FL	0.8189
Polk, FL	
Lancaster, PA	0.9943
Lancaster, PA	
Lansing-East Lansing, MI	1.0360
Clinton, MI	
Eaton, MI	
Ingham, MI	
Laredo, TX	0.7360
Webb, TX	
Las Cruces, NM	0.8469
Dona Ana, NM	
Las Vegas, NV	1.1147
Clark, NV	
Lawrence, KS	0.9910
Douglas, KS	
Lawton, OK	0.8523
Comanche, OK	
Lewiston-Auburn, ME	0.9192
Androscoggin, ME	
Lexington-Fayette, KY	0.9160
Bourbon, KY	
Clark, KY	
Fayette, KY	
Jessamine, KY	
Scott, KY	
Woodford, KY	
Lima, OH	0.9178
Allen, OH	
Auglaize, OH	
Lincoln, NE	0.9429
Lancaster, NE	
Little Rock-North Little Rock, AR	0.9240

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Faulkner, AR	
Lonoke, AR	
Pulaski, AR	
Saline, AR	
Longview-Marshall, TX	0.8154
Gregg, TX	
Harrison, TX	
Lorain-Elyria, OH	0.9362
Lorain, OH	
*Los Angeles-Long Beach, CA	1.2413
Los Angeles, CA	
Louisville, KY-IN	0.9547
Clark, IN	
Floyd, IN	
Harrison, IN	
Bullitt, KY	
Jefferson, KY	
Oldham, KY	
Shelby, KY	
Lubbock, TX	0.9714
Lubbock, TX	
Lynchburg, VA	0.8498
Amherst, VA	
Campbell, VA	
Lynchburg City, VA	
Macon-Warner Robins, GA	0.7803
Bibb, GA	
Houston, GA	
Jones, GA	
Peach, GA	
Madison, WI	1.0072
Dane, WI	
Manchester-Nashua, NH	0.9386
Hillsborough, NH	
Merrimack, NH	
Mansfield, OH	0.8896
Richland, OH	
Mayaguez, PR	0.4808
Anasco, PR	
Cabo Rojo, PR	
Hormigueros, PR	
Mayaguez, PR	
San German, PR	
McAllen-Edinburg-Mission, TX	0.7679
Hidalgo, TX	
Medford, OR	0.9653
Jackson, OR	
Melbourne-Titusville, FL	0.8894
Brevard, FL	
Memphis, TN-AR-MS	0.9412
Crittenden, AR	
De Soto, MS	
Shelby, TN	
Tipton, TN	
Merced, CA	1.0054
Merced, CA	
*Miami-Hialeah, FL	1.0225
Dade, FL	
Middlesex-Somerset-Hunterdon, NJ	0.9929
Hunterdon, NJ	
Middlesex, NJ	
Somerset, NJ	
Midland, TX	1.0511
Midland, TX	
*Milwaukee, WI	1.0132
Milwaukee, WI	
Ozaukee, WI	
Washington, WI	
Waukesha, WI	
*Minneapolis-St. Paul, MN-WI	1.1345

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Anoka, MN	
Carver, MN	
Chisago, MN	
Dakota, MN	
Hennepin, MN	
Isanti, MN	
Ramsey, MN	
Scott, MN	
Washington, MN	
Wright, MN	
St. Croix, WI	
Mobile, AL	0.8234
Baldwin, AL	
Mobile, AL	
Modesto, CA	1.0699
Stanislaus, CA	
Monmouth-Ocean, NJ	0.9387
Monmouth, NJ	
Ocean, NJ	
Monroe, LA	0.8150
Ouachita, LA	
Montgomery, AL	0.8039
Autauga, AL	
Elmore, AL	
Montgomery, AL	
Muncie, IN	0.9652
Delaware, IN	
Muskegon, MI	0.9904
Muskegon, MI	
Naples, FL	1.0000
Collier, FL	
Nashville, TN	0.8893
Cheatham, TN	
Davidson, TN	
Dickson, TN	
Robertson, TN	
Rutherford, TN	
Sumner, TN	
Williamson, TN	
Wilson, TN	
*Nassau-Suffolk, NY	1.2107
Nassau, NY	
Suffolk, NY	
New Bedford-Fall River-Attleboro, MA	0.9479
Bristol, MA	
New Haven-Waterbury-Meriden, CT	1.0768
New Haven, CT	
New London-Norwich, CT	1.0669
New London, CT	
*New Orleans, LA	0.9352
Jefferson, LA	
Orleans, LA	
St. Bernard, LA	
St. Charles, LA	
St. John The Baptist, LA	
St. Tammany, LA	
*New York, NY	1.3183
Bronx, NY	
Kings, NY	
New York City, NY	
Putnam, NY	
Queens, NY	
Richmond, NY	
Rockland, NY	
Westchester, NY	
*Newark, NJ	1.0879
Essex, NJ	
Morris, NJ	
Sussex, NJ	
Union, NJ	
Niagara Falls, NY	0.8546
Niagara, NY	
*Norfolk-Virginia Beach-Newport News, VA	0.9267

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Chesapeake City, VA	
Gloucester, VA	
Hampton City, VA	
James City Co., VA	
Newport News City, VA	
Norfolk City, VA	
Poquoson, VA	
Portsmouth City, VA	
Suffolk City, VA	
Virginia Beach City, VA	
Williamsburg City, VA	
York, VA	
*Oakland, CA	1.4029
Alameda, CA	
Contra Costa, CA	
Ocala, FL	0.8143
Marion, FL	
Odessa, TX	0.9275
Ector, TX	
Oklahoma City, OK	0.9862
Canadian, OK	
Cleveland, OK	
Logan, OK	
McClain, OK	
Oklahoma, OK	
Pottawatomie, OK	
Olympia, WA	1.0540
Thurston, WA	
Omaha, NE-IA	0.9736
Pottawattamie, IA	
Douglas, NE	
Sarpy, NE	
Washington, NE	
Orange County, NY	0.8900
Orange, NY	
Orlando, FL	0.9124
Orange, FL	
Osceola, FL	
Seminole, FL	
Owensboro, KY	0.8951
Daviess, KY	
Oxnard-Ventura, CA	1.3901
Ventura, CA	
Panama City, FL	0.7900
Bay, FL	
Parkersburg-Marietta, WV-OH	0.9065
Washington, OH	
Wood, WV	
Pascagoula, MS	0.8749
Jackson, MS	
Pensacola, FL	0.8251
Escambia, FL	
Santa Rosa, FL	
Peoria, IL	0.9794
Peoria, IL	
Tazewell, IL	
Woodford, IL	
*Philadelphia, PA-NJ	1.0774
Burlington, NJ	
Camden, NJ	
Gloucester, NJ	
Bucks, PA	
Chester, PA	
Delaware, PA	
Montgomery, PA	
Philadelphia, PA	
*Phoenix, AZ	1.0016
Maricopa, AZ	
Pine Bluff, AR	0.7991
Jefferson, AR	
*Pittsburgh, PA	1.0107

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Allegheny, PA	
Fayette, PA	
Washington, PA	
Westmoreland, PA	
Pittsfield, MA	1.0241
Berkshire, MA	
Ponce, PR	0.5473
Juana Diaz, PR	
Ponce, PR	
Portland, ME	0.9618
Cumberland, ME	
Sagadahoc, ME	
York, ME	
*Portland, OR	1.1215
Clackamas, OR	
Multnomah, OR	
Washington, OR	
Yamhill, OR	
Portsmouth-Dover-Rochester, NH	0.9399
Rockingham, NH	
Strafford, NH	
Poughkeepsie, NY	0.9728
Dutchess, NY	
*Providence-Pawtucket-Woonsocket, RI	0.9735
Bristol, RI	
Kent, RI	
Newport, RI	
Providence, RI	
Washington, RI	
Provo-Orem, UT	0.9275
Utah, UT	
Pueblo, CO	0.9295
Pueblo, CO	
Racine, WI	0.9183
Racine, WI	
Raleigh-Durham, NC	0.9395
Durham, NC	
Franklin, NC	
Orange, NC	
Wake, NC	
Rapid City, SD	0.8526
Pennington, SD	
Reading, PA	0.9118
Berks, PA	
Redding, CA	0.9901
Shasta, CA	
Reno, NV	1.1257
Washoe, NV	
Richland-Kennewick, WA	0.9720
Benton, WA	
Franklin, WA	
Richmond-Petersburg, VA	0.8864
Charles City Co., VA	
Chesterfield, VA	
Colonial Heights City, VA	
Dinwiddie, VA	
Goochland, VA	
Hanover, VA	
Henrico, VA	
Hopewell City, VA	
New Kent, VA	
Petersburg City, VA	
Powhatan, VA	
Prince George, VA	
Richmond City, VA	
*Riverside-San Bernardino, CA	1.1291
Riverside, CA	
San Bernardino, CA	
Roanoke, VA	0.8224
Botetourt, VA	
Roanoke, VA	
Roanoke City, VA	
Salem City, VA	
Rochester, MN	1.0539

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Olmsted, MN	
Rochester, NY	0.9490
Livingston, NY	
Monroe, NY	
Ontario, NY	
Orleans, NY	
Wayne, NY	
Rockford, IL	0.9906
Boone, IL	
Winnebago, IL	
*Sacramento, CA	1.2072
Eldorado, CA	
Placer, CA	
Sacramento, CA	
Yolo, CA	
Saginaw-Bay City-Midland, MI	1.0769
Bay, MI	
Midland, MI	
Saginaw, MI	
St. Cloud, MN	0.9690
Benton, MN	
Sherburne, MN	
Steams, MN	
St. Joseph, MO	0.8691
Buchanan, MO	
*St. Louis, MO-IL	1.0126
Clinton, IL	
Jersey, IL	
Madison, IL	
Monroe, IL	
St. Clair, IL	
Franklin, MO	
Jefferson, MO	
St. Charles, MO	
St. Louis, MO	
St. Louis City, MO	
Salem, OR	1.0503
Marion, OR	
Polk, OR	
Salinas-Seaside-Monterey, CA	1.2582
Monterey, CA	
*Salt Lake City-Ogden, UT	0.9271
Davis, UT	
Salt Lake, UT	
Weber, UT	
San Angelo, TX	0.8395
Tom Green, TX	
*San Antonio, TX	0.8334
Bexar, TX	
Comal, TX	
Guadalupe, TX	
*San Diego, CA	1.2359
San Diego, CA	
*San Francisco, CA	1.4350
Marin, CA	
San Francisco, CA	
San Mateo, CA	
*San Jose, CA	1.4702
Santa Clara, CA	
*San Juan, PR	0.5363
Barcelona, PR	
Bayamon, PR	
Canovanas, PR	
Carolina, PR	
Catano, PR	
Corozal, PR	

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Dorado, PR	
Fajardo, PR	
Florida, PR	
Guaynabo, PR	
Humacao, PR	
Juncos, PR	
Los Piedras, PR	
Loiza, PR	
Lugaillo, PR	
Manati, PR	
Naranjito, PR	
Rio Grande, PR	
San Juan, PR	
Toa Alta, PR	
Toa Baja, PR	
Trojeillo Alto, PR	
Vega Alta, PR	
Vega Baja, PR	
Santa Barbara-Santa Maria-Lompoc, CA	1.1722
Santa Barbara, CA	
Santa Cruz, CA	1.2325
Santa Cruz, CA	
Santa Fe, NM	0.9488
Los Alamos, NM	
Santa Fe, NM	
Santa Rosa-Petaluma, CA	1.4191
Sonoma, CA	
Sarasota, FL	0.9255
Sarasota, FL	
Savannah, GA	0.8415
Chatham, GA	
Effingham, GA	
Scranton-Wilkes Barre, PA	0.9240
Columbia, PA	
Lackawanna, PA	
Luzerne, PA	
Monroe, PA	
Wyoming, PA	
*Seattle, WA	1.0901
King, WA	
Snohomish, WA	
Sharon, PA	0.9209
Mercer, PA	
Sheboygan, WI	0.9329
Sheboygan, WI	
Sherman-Denison, TX	0.8911
Grayson, TX	
Shreveport, LA	0.8936
Bossier, LA	
Caddo, LA	
Sioux City, IA-NE	0.9026
Woodbury, IA	
Dakota, NE	
Sioux Falls, SD	0.9492
Minnehaha, SD	
South Bend-Mishawaka, IN	0.9712
St. Joseph, IN	
Spokane, WA	1.0764
Spokane, WA	
Springfield, IL	1.0040
Manard, IL	
Sangamon, IL	
Springfield, MO	0.8966
Christian, MO	
Greene, MO	
Springfield, MA	1.0040
Hampden, MA	
Hampshire, MA	

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
State College, PA	1.0463
Centre, PA	
Steubenville-Weirton, OH-WV	0.9122
Jefferson, OH	
Brooke, WV	
Hancock, WV	
Stockton, CA	1.1373
San Joaquin, CA	
Syracuse, NY	0.9760
Madison, NY	
Onondaga, NY	
Oswego, NY	
Tacoma, WA	1.0247
Pierce, WA	
Tallahassee, FL	0.8115
Gadsden, FL	
Leon, FL	
*Tampa-St. Petersburg-Clearwater, FL	0.8996
Hernando, FL	
Hillsborough, FL	
Pasco, FL	
Pinellas, FL	
Terre Haute, IN	0.8218
Clay, IN	
Vigo, IN	
Texarkana-TX-Texarkana, AR	0.8028
Miller, AR	
Bowie, TX	
Toledo, OH	1.0659
Fulton, OH	
Lucas, OH	
Wood, OH	
Topeka, KS	0.9901
Shawnee, KS	
Trenton, NJ	1.0310
Mercer, NJ	
Tucson, AZ	0.9777
Pima, AZ	
Tulsa, OK	0.9238
Creeks, OK	
Osage, OK	
Rogers, OK	
Tulsa, OK	
Wagoner, OK	
Tuscaloosa, AL	0.9423
Tuscaloosa, AL	
Tyler, TX	0.9239
Smith, TX	
Utica-Rome, NY	0.8101
Herkimer, NY	
Oneida, NY	
Vallejo-Fairfield-Napa, CA	1.2273
Napa, CA	
Solano, CA	
Vancouver, WA	1.0570
Clark, WA	
Victoria, TX	0.8249
Victoria, TX	
Vineland-Millville-Bridgeton, NJ	0.9808
Cumberland, NJ	
Visalia-Tulare-Porterville, CA	1.2797
Tulare, CA	
Waco, TX	0.8588
McLennan, TX	
*Washington, DC-MD-VA	1.0827
District of Columbia, DC	

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Calvert, MD	
Charles, MD	
Frederick, MD	
Montgomery, MD	
Prince Georges, MD	
Alexandria City, VA	
Arlington, VA	
Fairfax, VA	
Fairfax City, VA	
Falls Church City, VA	
Loudoun, VA	
Manassas City, VA	
Manassas Park City, VA	
Prince William, VA	
Stafford, VA	
Waterloo-Cedar Falls, IA	0.9456
Black Hawk, IA	
Bremer, IA	
Wausau, WI	0.9618
Marathon, WI	
West Palm Beach-Boca Raton-Delray Beach, FL	0.9472
Palm Beach, FL	
Wheeling, WV-OH	0.8554
Belmont, OH	
Marshall, WV	
Ohio, WV	
Wichita, KS	1.0226
Butler, KS	
Harvey, KS	
Sedgwick, KS	
Wichita Falls, TX	0.8316
Wichita, TX	
Williamsport, PA	0.9086
Lycoming, PA	
Wilmington, DE-NJ-MD	1.0279
New Castle, DE	
Cecil, MD	
Salem, NJ	
Wilmington, NC	0.8179
New Hanover, NC	
Worcester-Fitchburg-Leominster, MA	0.9417
Worcester, MA	
Yakima, WA	0.9915
Yakima, WA	
York, PA	0.9403
Adams, PA	
York, PA	
Youngstown-Warren, OH	1.0016
Mahoning, OH	
Trumbull, OH	
Yuba City, CA	1.0090

TABLE 4A.—WAGE INDEX FOR URBAN AREAS—Continued

[Areas that qualify as large urban areas are designated with an asterisk]

Urban area (constituent counties or county equivalents)	Wage index
Sutter, CA	
Yuba, CA	

TABLE 4B.—WAGE INDEX FOR RURAL AREAS

Nonurban area	Wage index
Alabama	0.6963
Alaska	1.3734
Arizona	0.8782
Arkansas	0.7071
California	1.0137
Colorado	0.8554
Connecticut	1.0175
Delaware	0.8332
Florida	0.8147
Georgia	0.7446
Hawaii	0.8840
Idaho	0.8568
Illinois	0.7994
Indiana	0.8033
Iowa	0.7933
Kansas	0.7908
Kentucky	0.7938
Louisiana	0.7584
Maine	0.8233
Maryland	0.7966
Massachusetts	1.0135
Michigan	0.9110
Minnesota	0.8929
Mississippi	0.7176
Missouri	0.7461
Montana	0.8499
Nebraska	0.7680
Nevada	0.9473
New Hampshire	0.8872
New Jersey ¹	
New Mexico	0.8049
New York	0.8069
North Carolina	0.7639
North Dakota	0.8395
Ohio	0.8650
Oklahoma	0.7908
Oregon	0.9908
Pennsylvania	0.8760
Puerto Rico	0.5371
Rhode Island ¹	
South Carolina	0.7192
South Dakota	0.7557
Tennessee	0.7043
Texas	0.7609
Utah	0.8613
Vermont	0.8400
Virginia	0.7868
Washington	0.9916
West Virginia	0.8499
Wisconsin	0.8454
Wyoming	0.9025

¹ All counties within the State are classified urban.

TABLE 4C.—WAGE INDEX FOR RURAL COUNTIES WHOSE HOSPITALS ARE DEEMED URBAN

[Area that qualify as large urban areas are designated with an asterisk]

County	Urban area	Wage index
Limestone, AL	Huntsville, AL	0.7455
Marshall, AL	Huntsville, AL	0.7207
Charlotte, FL	Sarasota, FL	0.8311
Indian River, FL	Fort Pierce, FL	0.8613
Christian, IL	Springfield, IL	0.7895
Macoupin, IL	*St. Louis, MO-IL	0.7592
Mason, IL	Peoria, IL	0.7364
Clinton, IN	Lafayette, IN	0.8095
Henry, IN	Anderson, IN	0.8411
Owen, IN ¹	Bloomington, IN	
Jefferson, KS	Topeka, KS	0.6041
Allegan, MI	Grand Rapids, MI	1.0075
Barry, MI	Battle Creek, MI	0.8337
Cass, MI	Benton Harbor, MI	0.7956
Ionia, MI	Lansing-East Lansing, MI	0.8396
Lenawee, MI	Ann Arbor, MI	1.0242
Shiawassee, MI	Flint, MI	1.0236
Tuscola, MI	Saginaw-Bay City-Midland, MI	0.9020
Van Buren, MI	Kalamazoo, MI	0.8610
Clinton, MO	*Kansas City, KS-MO	0.6306
Cass, NE ¹	Omaha, NE	
Caswell, NC ¹	Danville, VA	
Currituck, NC ¹	*Norfolk-Virginia Beach-Newport News, VA	
Harnett, NC	Fayetteville, NC	0.7497
Genesee, NY	Rochester, NY	0.7175
Columbiana, OH	Beaver County, PA	0.9089
Morrow, OH	Mansfield, OH	0.6742
Preble, OH ¹	Dayton-Springfield, OH	
Van Wert, OH	Lima, OH	0.8375
Lawrence, PA	Beaver County, PA	0.8469
Gherokee, SC	Greenville-Spartanburg, SC	0.7244
Bedford, VA	Roanoke, VA	0.7261
Fredericksburg City, VA	*Washington, DC-MD-VA	0.8232
Isle of Wight, VA ¹	Norfolk-Virginia Beach-Newport News, VA	
Spotsylvania, VA ¹	*Washington, DC-MD-VA	
Jefferson, WI	*Milwaukee, WI	0.8740
Walworth, WI	*Milwaukee, WI	0.9475
Jefferson, WV	*Washington, DC-MD-VA	0.6886
Lincoln, WV ¹	Charleston, WV	

¹ There are no prospective payment hospitals in these counties.

BILLING CODE 4120-03-M

TABLE 5

LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
1	01	SURG	3.5670	13.8	42
2	01	SURG	4.1379	12.8	41
3	01	SURG	2.9830	12.7	41
4	01	SURG	2.8483	11.8	40
5	01	SURG	1.5214	6.1	34
6	01	SURG	.4709	2.0	17
7	01	SURG	3.1110	13.2	41
8	01	SURG	.7355	3.2	31
9	01	MED	1.4058	7.0	35
10	01	MED	1.2449	7.8	36
11	01	MED	.7451	4.7	33
12	01	MED	.9391	6.9	35
13	01	MED	.8699	7.0	35
14	01	MED	1.2260	7.4	35
15	01	MED	.6350	4.2	32
16	01	MED	1.0949	6.8	35
17	01	MED	.6452	4.6	33
18	01	MED	.9640	6.3	34
19	01	MED	.5869	4.1	32
20	01	MED	1.7817	8.1	36
21	01	MED	1.4190	7.6	36
22	01	MED	.6981	4.4	32
23	01	MED	.8698	4.4	32
24	01	MED	.9669	5.4	33
25	01	MED	.5270	3.6	29
26	01	MED	.7313	3.5	31
27	01	MED	1.6124	4.6	33
28	01	MED	1.2750	6.1	34
29	01	MED	.5730	3.4	31
30	01	MED	.3496	2.0	17
31	01	MED	.7007	4.3	32
32	01	MED	.4038	2.7	25
33	01	MED	.2427	1.6	9
34	01	MED	1.2069	6.0	34
35	01	MED	.5597	3.7	32

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.

NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

TABLE 5

LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
36	02	SURG	.6443	2.6	14
37	02	SURG	.7415	3.1	31
38	02	SURG	.3550	2.1	16
39	02	SURG	.4494	1.7	7
40	02	SURG	.4762	2.0	20
41	02	SURG	.3613	1.6	7
42	02	SURG	.6305	2.3	16
43	02	NEED	.3350	3.7	24
44	02	NEED	.6035	5.5	33
45	02	NEED	.5454	3.3	30
46	02	NEED	.6495	4.0	32
47	02	NEED	.3539	2.6	29
48	02	NEED	.3969	2.9	30
49	03	SURG	2.8633	11.0	39
50	03	SURG	.6298	2.3	15
51	03	SURG	.5647	2.1	18
52	03	SURG	.8129	2.7	26
53	03	SURG	.6161	2.0	20
54	03	SURG	.6806	3.2	22
55	03	SURG	.4879	1.7	14
56	03	SURG	.4881	1.8	14
57	03	SURG	.9313	3.5	32
58	03	SURG	.3060	1.5	4
59	03	SURG	.3878	1.6	11
60	03	SURG	.2584	1.5	4
61	03	SURG	.6945	2.3	30
62	03	SURG	.3052	1.3	5
63	03	SURG	1.1882	4.3	32
64	03	NEED	1.1762	5.1	33
65	03	NEED	.4564	3.4	23
66	03	NEED	.4496	3.3	24
67	03	NEED	.8589	4.4	32
68	03	NEED	.7232	5.0	33
69	03	NEED	.5281	3.9	25
70	03	NEED	.4589	3.3	22

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.
NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

TABLE 5

LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
71	03	MED			
72	03	MED	.7307	4.5	32
73	03	MED	.5528	3.3	31
74	03	MED	.7525	4.0	32
75	04	MED	.3386	2.1	20
76	04	SURG	2.9603	11.9	40
76	04	SURG	2.3038	10.5	38
77	04	SURG	1.0895	4.9	33
78	04	MED	1.4320	8.8	37
79	04	MED	1.8530	9.4	37
80	04	MED	1.1382	7.1	35
81	04	MED	1.0899	6.1	34
82	04	MED	1.2016	6.6	35
83	04	MED	1.0064	6.5	35
84	04	MED	.5009	3.9	32
85	04	MED	1.1437	6.8	35
86	04	MED	.7223	4.6	33
87	04	MED	1.4597	6.1	34
88	04	MED	1.0153	6.1	34
89	04	MED	1.2059	7.2	35
90	04	MED	.7790	5.7	32
91	04	MED	.7465	4.6	30
92	04	MED	1.2182	6.9	35
93	04	MED	.7936	5.2	33
94	04	MED	1.3378	7.4	35
95	04	MED	.6665	4.8	33
96	04	MED	.9734	6.0	34
97	04	MED	.6810	4.7	27
98	04	MED	.8942	6.2	34
99	04	MED	.8493	4.4	32
100	04	MED	.5125	2.8	20
101	04	MED	.9966	5.3	33
102	04	MED	.5593	3.4	31
103	05	SURG	13.2352	26.4	54
104	05	SURG	7.8432	18.4	46
105	05	SURG	5.9965	13.2	41

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.

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TABLE 5

LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
106	05	SURG	5.6558	14.2	42
107	05	SURG	4.2260	10.8	39
108	05	SURG	5.7332	11.5	39
109	05	SURG	8.7746	7.5	36
110	05	SURG	3.5967	12.3	40
111	05	SURG	2.0351	8.3	36
112	05	SURG	1.9106	5.3	33
113	05	SURG	2.4616	14.3	42
114	05	SURG	1.6119	9.8	38
115	05	SURG	3.8541	12.6	41
116	05	SURG	2.5793	6.1	34
117	05	SURG	1.8867	4.8	33
118	05	SURG	2.0267	3.9	32
119	05	SURG	.8269	3.7	32
120	05	SURG	2.7059	10.8	39
121	05	MED	1.6228	8.6	37
122	05	MED	1.1233	6.2	34
123	05	MED	1.3934	3.0	31
124	05	MED	1.1876	4.5	32
125	05	MED	.6874	2.3	20
126	05	MED	2.9894	16.8	45
127	05	MED	1.0169	6.2	34
128	05	MED	.8129	7.8	35
129	05	MED	1.3986	2.7	31
130	05	MED	.8921	5.9	34
131	05	MED	.5814	4.2	32
132	05	MED	.7565	4.3	32
133	05	MED	.5420	3.2	27
134	05	MED	.5964	4.3	32
135	05	MED	.9018	5.1	33
136	05	MED	.5488	3.4	29
137	05	MED	.6239	3.3	31
138	05	MED	.8707	4.8	33
139	05	MED	.5715	3.4	26
140	05	MED	.6387	3.9	25

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.
NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

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LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
141	05	MED			
142	05	MED	.6920	4.5	32
143	05	MED	.5149	3.3	23
144	05	MED	.5226	2.9	19
145	05	MED	1.1035	5.6	34
			.6236	3.5	31
146	06	SURG			
147	06	SURG	2.7386	13.8	42
148	06	SURG	1.7349	9.9	37
149	06	SURG	3.2705	14.3	42
150	06	SURG	1.6636	9.9	32
			2.6617	12.4	40
151	06	SURG			
152	06	SURG	1.3478	8.0	36
153	06	SURG	1.4678	7.7	36
154	06	SURG	1.0149	6.5	34
155	06	SURG	3.8172	13.0	41
			1.6050	8.0	36
156	06	SURG			
157	06	SURG	.8281	6.0	34
158	06	SURG	.9571	5.4	33
159	06	SURG	.5136	2.9	23
160	06	SURG	1.1037	5.5	33
			.6314	3.3	23
161	06	SURG			
162	06	SURG	.7337	3.5	32
163	06	SURG	.4485	2.1	14
164	06	SURG	.7729	3.5	26
165	06	SURG	2.3737	10.6	39
			1.3377	7.6	26
166	06	SURG			
167	06	SURG	1.3991	6.8	35
168	03	SURG	1.7922	4.4	17
169	03	SURG	1.0050	3.7	32
170	06	SURG	.5483	2.2	19
			2.8091	11.4	39
171	06	SURG			
172	06	MED	1.2563	6.1	34
173	06	MED	1.2216	7.1	35
174	06	MED	.6657	4.0	32
175	06	MED	.9620	5.5	34
			.5983	4.1	25

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** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.

NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

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LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

				RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
211	08	SURG	HIP & FEMUR PROCEDURES EXCEPT MAJOR JOINT AGE >17 W/O CC	1.4716	10.1	38
212	08	SURG	HIP & FEMUR PROCEDURES EXCEPT MAJOR JOINT AGE 0-17	1.4023	7.3	31
213	08	SURG	AMPUTATION FOR MUSCULOSKELETAL SYSTEM & CONN TISSUE DISORDERS	1.7701	9.9	38
214	08	SURG	BACK & NECK PROCEDURES WITH CC	1.9997	11.1	39
215	08	SURG	BACK & NECK PROCEDURES W/O CC	1.2155	7.5	35
216	08	SURG	BIOPSIES OF MUSCULOSKELETAL SYSTEM & CONNECTIVE TISSUE	1.7852	9.2	37
217	08	SURG	WID DEBRID & SKN GRAFT EXCEPT HAND, FOR MUSCULOSKELET & CONN TISS DIS	3.0640	14.0	42
218	08	SURG	LOWER EXTREM & HUMER PROC EXCEPT HIP, FOOT, FEMUR AGE >17 WITH CC	1.5359	8.2	36
219	08	SURG	LOWER EXTREM & HUMER PROC EXCEPT HIP, FOOT, FEMUR AGE >17 W/O CC	.9363	5.2	33
220	08	SURG	LOWER EXTREM & HUMER PROC EXCEPT HIP, FOOT, FEMUR AGE 0-17	.9130	5.3	33
221	08	SURG	KNEE PROCEDURES WITH CC	1.5409	6.9	35
222	08	SURG	KNEE PROCEDURES W/O CC	.8855	3.7	32
223	08	SURG	MAJOR SHOULDER/ELBOW PROC. OR OTHER UPPER EXTREMITY PROC W CC	.8405	3.8	32
224	08	SURG	SHOULDER, ELBOW OR FOREARM PROC, EXC MAJOR JOINT PROC, W/O CC	.6248	2.8	19
225	08	SURG	FOOT PROCEDURES	.7063	3.2	31
226	08	SURG	SOFT TISSUE PROCEDURES WITH CC	1.4908	6.9	35
227	08	SURG	SOFT TISSUE PROCEDURES W/O CC	.6619	3.1	30
228	08	SURG	MAJOR THUMB OR JOINT PROC. OR OTH HAND OR WRIST PROC W CC	.7911	2.8	28
229	08	SURG	HAND OR WRIST PROC, EXCEPT MAJOR JOINT PROC, W/O CC	.5117	1.9	15
230	08	SURG	LOCAL EXCISION & REMOVAL OF INT FIX DEVICES OF HIP & FEMUR	.8763	4.3	32
231	08	SURG	LOCAL EXCISION & REMOVAL OF INT FIX DEVICES EXCEPT HIP & FEMUR	.9107	3.6	32
232	08	SURG	ARTHROSCOPY	1.1229	3.7	32
233	08	SURG	OTHER MUSCULOSKELET SYS & CONN TISS O.R. PROC WITH CC	1.7280	8.6	37
234	08	SURG	OTHER MUSCULOSKELET SYS & CONN TISS O.R. PROC W/O CC	.9477	4.6	33
235	08	MED	FRACTURES OF FEMUR	1.1575	8.1	36
236	08	MED	FRACTURES OF HIP & PELVIS	.9565	6.9	35
237	08	MED	SPRAINS, STRAINS, & DISLOCATIONS OF HIP, PELVIS & THIGH	.5662	4.5	33
238	08	MED	OSTEOARTHRITIS	1.5778	10.4	38
239	08	MED	PATHOLOGICAL FRACTURES & MUSCULOSKELETAL & CONN TISS MALIGNANCY	.9843	7.6	36
240	08	MED	CONNECTIVE TISSUE DISORDERS WITH CC	1.0769	7.1	35
241	08	MED	CONNECTIVE TISSUE DISORDERS W/O CC	.6218	5.0	33
242	08	MED	SEPTIC ARTHRITIS	1.8229	8.6	37
243	08	MED	MEDICAL BACK PROBLEMS	.6501	5.0	33
244	08	MED	BONE DISEASES & SPECIFIC ARTHROPATHIES WITH CC	.7184	5.4	33
245	08	MED	BONE DISEASES & SPECIFIC ARTHROPATHIES W/O CC	.5108	4.1	32

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			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
246	08	MED			
247	08	MED			
248	08	MED			
249	08	MED			
250	08	MED			
251	08	MED			
252	08	MED			
253	08	MED			
254	08	MED			
255	08	MED			
256	08	MED			
257	09	SURG			
258	09	SURG			
259	09	SURG			
260	09	SURG			
261	09	SURG			
262	09	SURG			
263	09	SURG			
264	09	SURG			
265	09	SURG			
266	09	SURG			
267	09	SURG			
268	09	SURG			
269	09	SURG			
270	09	SURG			
271	09	MED			
272	09	MED			
273	09	MED			
274	09	MED			
275	09	MED			
276	09	MED			
277	09	MED			
278	09	MED			
279	09	MED			
280	09	MED			

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			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
281	09	MED			
282	09	MED	.4233	3.3	31
283	09	MED	.3333	2.2	19
284	09	MED	.7624	5.5	34
285	10	MED	.4659	3.7	32
			2.8191	16.2	44
286	10	SURG			
287	10	SURG	2.5261	10.9	39
288	10	SURG	2.2372	13.7	42
289	10	SURG	1.8656	7.4	35
290	10	SURG	1.0587	4.7	33
			.7805	3.4	21
291	10	SURG			
292	10	SURG	.4589	1.9	10
293	10	SURG	2.7779	12.4	40
294	10	MED	1.1289	6.2	34
295	10	MED	.7509	5.9	34
			.7252	4.4	32
296	10	MED			
297	10	MED	.9404	6.1	34
298	10	MED	.5480	4.2	32
299	10	MED	.6768	3.6	32
300	10	MED	.8623	4.8	33
			1.1086	7.1	35
301	10	MED			
302	11	SURG	.6250	4.4	32
303	11	SURG	3.7905	15.4	43
304	11	SURG	2.6773	12.3	40
305	11	SURG	2.4944	11.0	39
			1.2607	6.0	34
306	11	SURG	1.4060	7.8	36
307	11	SURG	.7931	4.6	28
308	11	SURG	1.5067	6.9	35
309	11	SURG	.7882	3.6	32
310	11	SURG	.9014	4.4	32
311	11	SURG			
312	11	SURG	.5211	2.5	18
313	11	SURG	.8071	4.1	32
314	11	SURG	.4757	2.4	21
315	11	SURG	.4271	2.3	26
			2.3366	8.2	36

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			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
316	11	MED	1.2689	6.4	34
317	11	MED	.3814	2.3	22
318	11	MED	1.0637	6.1	34
319	11	MED	.5453	2.8	31
320	11	MED	1.0261	6.9	35
RENAL FAILURE					
ADMIT FOR RENAL DIALYSIS					
321	11	MED	.6830	5.2	31
322	11	MED	.7006	4.6	33
323	11	MED	.7726	3.0	31
324	11	MED	.3964	2.2	16
325	11	MED	.6673	4.5	32
KIDNEY & URINARY TRACT INFECTIONS AGE >17 WITH CC					
326	11	MED	.4276	3.0	25
327	11	MED	.5444	3.1	31
328	11	MED	.6445	3.9	32
329	11	MED	.4020	2.3	19
330	11	MED	.2754	1.6	9
KIDNEY & URINARY TRACT SIGNS & SYMPTOMS AGE >17 WITH CC					
331	11	MED	.9501	5.3	33
332	11	MED	.5557	3.3	31
333	11	MED	.8884	4.9	33
334	11	MED	1.8224	10.3	33
335	12	SURG	1.3462	8.4	24
OTHER KIDNEY & URINARY TRACT DIAGNOSES AGE >17 WITH CC					
336	12	SURG	.9827	5.8	30
337	12	SURG	.6603	4.2	15
338	12	SURG	.7604	3.1	31
339	12	SURG	.5847	2.5	30
340	12	SURG	.4283	2.4	13
OTHER KIDNEY & URINARY TRACT DIAGNOSES AGE >17 W/D CC					
341	12	SURG	.9851	3.8	29
342	12	SURG	.4806	2.1	29
343	12	SURG	.3742	1.7	6
344	12	SURG	1.0569	5.3	33
345	12	SURG	.7877	4.1	32
PENIS PROCEDURES					
CIRCUMCISION AGE >17					
CIRCUMCISION AGE 0-17					
OTHER MALE REPRODUCTIVE SYSTEM D.R. PROCEDURES FOR MALIGNANCY					
OTHER MALE REPRODUCTIVE SYSTEM D.R. PROC EXCEPT FOR MALIGNANCY					
346	12	MED	.9214	5.5	34
347	12	MED	.4664	2.5	29
348	12	MED	.6635	3.8	32
349	12	MED	.3828	2.1	19
350	12	MED	.6716	4.9	29
MALIGNANCY, MALE REPRODUCTIVE SYSTEM, WITH CC					
MALIGNANCY, MALE REPRODUCTIVE SYSTEM, W/O CC					
BENIGN PROSTATIC HYPERTROPHY WITH CC					
BENIGN PROSTATIC HYPERTROPHY W/O CC					
INFLAMMATION OF THE MALE REPRODUCTIVE SYSTEM					

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LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
351	12	MED			
352	12	MED	.3293	1.3	5
353	13	SURG	.5500	3.1	31
354	13	SURG	2.0645	11.4	39
355	13	SURG	1.4248	8.2	36
			.8943	5.7	15
356	13	SURG			
357	13	SURG	.7291	4.8	19
358	13	SURG	2.1705	10.8	39
359	13	SURG	1.2032	7.1	29
360	13	SURG	.8132	5.4	14
			.7760	3.8	32
361	13	SURG			
362	13	SURG	.6859	2.7	31
363	13	SURG	.3490	1.5	6
364	13	SURG	.6987	3.6	32
365	13	SURG	.4669	2.3	21
			1.8928	8.8	37
366	13	MED			
367	13	MED	1.1726	6.6	35
368	13	MED	.4896	2.9	31
369	13	MED	.8927	5.9	34
370	14	SURG	.5109	3.1	31
			.9848	6.2	34
371	14	SURG			
372	14	MED	.6544	4.5	13
373	14	MED	.4540	3.1	20
374	14	SURG	.2987	2.2	8
375	14	SURG	.4981	2.7	8
			.6735	4.4	29
376	14	MED			
377	14	SURG	.3502	2.8	25
378	14	MED	1.5119	3.6	32
379	14	MED	.7232	4.2	15
380	14	MED	.2493	2.0	14
			.2644	1.8	14
381	14	SURG			
382	14	MED	.3769	1.7	13
383	14	MED	.1186	1.2	4
384	14	MED	.3759	3.4	31
385	15		.8279	2.2	29
			1.2084	1.8	30

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LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

		RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
386	13	3.6039	17.9	46
387	15	1.8046	13.3	41
388	15	1.1431	8.6	37
389	15	2.4098	7.3	35
390	15	.8111	3.8	32
391	15	.2191	3.1	11
392	15	3.5891	12.4	40
393	16	1.5022	9.1	37
394	16	1.5355	5.7	34
395	16	.7466	4.6	33
396	16	.3575	1.8	15
397	16	1.0955	5.5	34
398	16	1.2279	6.7	35
399	16	.6906	4.1	32
400	17	2.5981	10.5	38
401	17	2.2572	10.4	38
402	17	.8945	4.1	32
403	17	1.6044	8.3	36
404	17	.7753	4.6	33
405	17	1.0281	4.9	33
406	17	2.7445	11.9	40
407	17	1.3042	6.4	34
408	17	.9592	4.1	32
409	17	1.0357	6.9	35
410	17	.4890	2.6	20
411	17	.4543	2.7	27
412	17	.4046	2.1	20
413	17	1.2853	7.3	35
414	17	.7557	4.7	33
415	18	3.6424	15.1	49
416	18	1.5346	7.4	35
417	18	.8929	5.3	33
418	18	.9641	6.6	35
419	18	.9552	5.9	34
420	18	.6805	4.7	33

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.

NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

TABLE 5

LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
421	18	MED	.6337	4.3	31
422	18	MED	.5874	4.0	27
423	18	MED	1.5845	8.0	36
424	19	SURG	2.3418	13.7	42
425	19	MED	.6470	4.5	32
426	19	MED	.6255	5.6	34
427	19	MED	.6133	5.4	33
428	19	MED	.7325	6.3	34
429	19	MED	.9016	7.5	35
430	19	MED	.8957	8.8	37
431	19	MED	.6347	5.9	34
432	19	MED	.7329	4.5	32
433	20		.3974	3.2	31
434	20		.7886	5.7	34
435	20		.5510	4.9	33
436	20		.9873	12.0	40
437	20		1.2005	13.8	42
438	20		.0000	.0	0
439	21	SURG	1.6731	6.7	35
440	21	SURG	2.4992	10.7	39
441	21	SURG	.7361	2.5	31
442	21	SURG	1.8642	5.6	34
443	21	SURG	1.1906	4.2	32
444	21	MED	.7694	5.3	33
445	21	MED	.4950	3.7	32
446	21	MED	.4738	2.4	22
447	21	MED	.4702	2.6	24
448	21	MED	.3428	2.9	17
449	21	MED	.7983	4.4	32
450	21	MED	.4648	2.7	28
451	21	MED	.3947	2.6	16
452	21	MED	.8932	4.6	33
453	21	MED	.4725	3.1	31
454	21	MED	.9104	4.6	33
455	21	MED	.4226	2.7	27

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.

NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

TABLE 5

LIST OF DIAGNOSIS RELATED GROUPS (DRGS), RELATIVE WEIGHTING FACTORS, GEOMETRIC MEAN LENGTH OF STAY, AND LENGTH OF STAY OUTLIER CUTOFF POINTS USED IN THE PROSPECTIVE PAYMENT SYSTEM

			RELATIVE WEIGHTS	GEOMETRIC MEAN LOS	OUTLIER THRESHOLD
456	22	BURNS, TRANSFERRED TO ANOTHER ACUTE CARE FACILITY	.7762	2.5	31
457	22	EXTENSIVE BURNS W/O O.R. PROCEDURE	1.9047	14.4	42
458	22	NON-EXTENSIVE BURNS W SKIN GRAFT	.7540	5.1	33
459	22	NON-EXTENSIVE BURNS W WOUND DEBRIDEMENT OR OTHER O.R. PROC	.4719	3.3	31
460	22	NON-EXTENSIVE BURNS W/O O.R. PROCEDURE	.9282	1.8	12
461	23	O.R. PROC W DIAGNOSES OF OTHER CONTACT W HEALTH SERVICES	.5463	2.6	31
462	23	REHABILITATION	.4339	2.4	30
463	23	SIGNS & SYMPTOMS W CC	3.3150	12.7	41
464	23	SIGNS & SYMPTOMS W/O CC	.0000	.0	0
465	23	AFTERCARE W HISTORY OF MALIGNANCY AS SECONDARY DIAGNOSIS	.0000	.0	0
466	23	AFTERCARE W/O HISTORY OF MALIGNANCY AS SECONDARY DIAGNOSIS			
467	23	OTHER FACTORS INFLUENCING HEALTH STATUS			
468	23	EXTENSIVE O.R. PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS			
469		PRINCIPAL DIAGNOSIS INVALID AS DISCHARGE DIAGNOSIS			
470		** UNGROUPABLE			
471	08	BILATERAL OR MULTIPLE MAJOR JOINT PROCS OF LOWER EXTREMITY	3.9872	15.4	43
472	22	EXTENSIVE BURNS W O.R. PROCEDURE	12.7129	19.1	47
473	17	ACUTE LEUKEMIA W/O MAJOR O.R. PROCEDURE AGE >17	3.0963	9.4	37
474	04	RESPIRATORY SYSTEM DIAGNOSIS WITH TRACHEOSTOMY	13.4688	37.6	66
475	04	RESPIRATORY SYSTEM DIAGNOSIS WITH VENTILATOR SUPPORT	3.6290	9.9	38
476		PROSTATIC O.R. PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS	2.2425	15.0	43
477		NON-EXTENSIVE O.R. PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS	1.4318	6.6	35

* MEDICARE DATA HAVE BEEN SUPPLEMENTED BY DATA FROM MARYLAND AND MICHIGAN FOR LOW VOLUME DRGS.

** DRGS 469 AND 470 CONTAIN CASES WHICH COULD NOT BE ASSIGNED TO VALID DRGS.

NOTE: GEOMETRIC MEAN IS USED ONLY TO DETERMINE PAYMENT FOR OUTLIER AND TRANSFER CASES.

NOTE: RELATIVE WEIGHTS ARE BASED ON MEDICARE PATIENT DATA AND MAY NOT BE APPROPRIATE FOR OTHER PATIENTS.

BILLING CODE 4120-03-C

TABLE 6A—NEW DIAGNOSIS CODES

Diagnosis Code	Description	DRG	CC
088.81	Lyme disease.....	423.....	No.
088.89	Other specified arthropod-borne diseases.....	423.....	No.
345.00	Generalized nonconvulsive epilepsy, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.01	Generalized nonconvulsive epilepsy, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.10	Generalized convulsive epilepsy, without mention of intractable epilepsy.....	24, 25, 26.....	Yes.
345.11	Generalized convulsive epilepsy, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.40	Partial epilepsy, with impairment of consciousness, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.41	Partial epilepsy, with impairment of consciousness, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.50	Partial epilepsy, without mention of impairment of consciousness, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.51	Partial epilepsy, without mention of impairment of consciousness, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.60	Infantile spasms, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.61	Infantile spasms, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.70	Epilepsia partialis continua, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.71	Epilepsia partialis continua, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.80	Other forms of epilepsy, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.81	Other forms of epilepsy, with intractable epilepsy.....	24, 25, 26.....	Yes.
345.90	Epilepsy, unspecified, without mention of intractable epilepsy.....	24, 25, 26.....	No.
345.91	Epilepsy, unspecified with intractable epilepsy.....	24, 25, 26.....	Yes.
403.00	Hypertensive renal disease, malignant, without mention of renal failure.....	331, 332, 333.....	Yes.
403.01	Hypertensive renal disease, malignant, with renal failure.....	316.....	Yes.
403.10	Hypertensive renal disease, benign, without mention of renal failure.....	331, 332, 333.....	No.
403.11	Hypertensive renal disease, benign, with renal failure.....	316.....	Yes.
403.90	Hypertensive renal disease, unspecified, without mention of renal failure.....	331, 332, 333.....	No.
403.91	Hypertensive renal disease, unspecified, with renal failure.....	316.....	Yes.
404.00	Hypertensive heart and renal disease, malignant, without mention of congestive heart failure or renal failure.....	134.....	Yes.
404.01	Hypertensive heart and renal disease, malignant, with congestive heart failure.....	124, 127.....	Yes.
404.02	Hypertensive heart and renal disease, malignant, with renal failure.....	316.....	Yes.
404.03	Hypertensive heart and renal disease, malignant, with congestive heart failure and renal failure.....	124, 127.....	Yes.
404.10	Hypertensive heart and renal disease, benign, without mention of congestive heart failure or renal failure.....	134.....	No.
404.11	Hypertensive heart and renal disease, benign, with congestive heart failure.....	124, 127.....	Yes.
404.12	Hypertensive heart and renal disease, benign, with renal failure.....	316.....	Yes.
404.13	Hypertensive heart and renal disease, benign, with congestive heart failure and renal failure.....	124, 127.....	Yes.
404.90	Hypertensive heart and renal disease, unspecified, without mention of congestive heart failure or renal failure.....	134.....	No.
404.91	Hypertensive heart and renal disease, unspecified, with congestive heart failure.....	124, 127.....	Yes.
404.92	Hypertensive heart and renal disease, unspecified, with renal failure.....	316.....	Yes.
404.93	Hypertensive heart and renal disease, unspecified, with congestive heart failure and renal failure.....	124, 127.....	Yes.
410.00	Acute myocardial infarction, of anterolateral wall, episode of care, unspecified.....	132, 133.....	No.
410.01	Acute myocardial infarction, of anterolateral wall, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.02	Acute myocardial infarction, of anterolateral wall, subsequent episode of care.....	132, 133.....	No.
410.10	Acute myocardial infarction, of other anterior wall, subsequent episode of care unspecified.....	132, 133.....	No.
410.11	Acute myocardial infarction, of other anterior wall, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.12	Acute myocardial infarction, of other anterior wall, subsequent episode of care.....	132, 133.....	No.
410.20	Acute myocardial infarction, of inferolateral wall, episode of care unspecified.....	132, 133.....	No.
410.21	Acute myocardial infarction, of inferolateral wall, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.22	Acute myocardial infarction, of inferolateral wall, subsequent episode of care.....	132, 133.....	No.
410.30	Acute myocardial infarction, of inferoposterior wall, episode of care unspecified.....	132, 133.....	No.
410.31	Acute myocardial infarction, of inferoposterior wall, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.32	Acute myocardial infarction, of inferoposterior wall, subsequent episode of care.....	132, 133.....	No.
410.40	Acute myocardial infarction, of other inferior wall, episode of care unspecified.....	132, 133.....	No.
410.41	Acute myocardial infarction, of other inferior wall, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.42	Acute myocardial infarction, of other inferior wall, subsequent episode of care.....	132, 133.....	No.
410.50	Acute myocardial infarction, of other lateral wall, episode of care unspecified.....	132, 133.....	No.
410.51	Acute myocardial infarction, of other lateral wall, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.52	Acute myocardial infarction, of other lateral wall, subsequent episode of care.....	132, 133.....	No.
410.60	Acute myocardial infarction, true posterior wall infarction, episode of care unspecified.....	132, 133.....	No.
410.61	Acute myocardial infarction, true posterior wall infarction, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.62	Acute myocardial infarction, true posterior wall infarction, subsequent episode of care.....	132, 133.....	No.
410.70	Acute myocardial infarction, subendocardial infarction, episode of care unspecified.....	132, 133.....	No.
410.71	Acute myocardial infarction, subendocardial infarction, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.72	Acute myocardial infarction, subendocardial infarction, subsequent episode of care.....	132, 133.....	No.
410.80	Acute myocardial infarction, of other specified sites, episode of care unspecified.....	132, 133.....	No.
410.81	Acute myocardial infarction, of other specified sites, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.82	Acute myocardial infarction, of other specified sites, subsequent episode of care.....	132, 133.....	No.
410.90	Acute myocardial infarction, unspecified site, episode of care unspecified.....	132, 133.....	No.
410.91	Acute myocardial infarction, unspecified site, initial episode of care.....	115, 121, 122, 123.....	Yes.
410.92	Acute myocardial infarction, unspecified site, subsequent episode of care.....	132, 133.....	No.
411.81	Acute ischemic heart disease without myocardial infarction.....	124, 140.....	Yes.
411.89	Other acute and subacute forms of ischemic heart disease.....	124, 140.....	Yes.
429.71	Acquired cardiac septal defect.....	124, 144, 145.....	Yes.
429.79	Other certain sequelae of myocardial infarction, not elsewhere classified.....	124, 144, 145.....	Yes.
493.20	Chronic obstructive asthma (with obstructive pulmonary disease), without mention of status asthmaticus.....	88.....	Yes.
493.21	Chronic obstructive asthma (with obstructive pulmonary disease), with status asthmaticus.....	88.....	Yes.
651.30	Twin pregnancy with fetal loss and retention of one fetus, unspecified as to episode of care or not applicable.....	469.....	No.
651.31	Twin pregnancy with fetal loss and retention of one fetus, delivered, with or without mention of antepartum condition.....	370, 371, 372, 373, 374, 375.....	No.
651.33	Twin pregnancy with fetal loss and retention of one fetus, antepartum condition or complication.....	383, 384.....	No.
651.40	Triplet pregnancy with fetal loss and retention of one or more fetus(es), unspecified as to episode of care or not applicable.....	469.....	No.

TABLE 6A—NEW DIAGNOSIS CODES—Continued

Diagnosis Code	Description	DRG	CC
651.41	Triplet pregnancy with fetal loss and retention of one or more fetus(es), delivered, with or without mention of antepartum condition.	370, 371, 372, 373, 374, 375.	No.
651.43	Triplet pregnancy with fetal loss and retention of one or more fetus(es), antepartum condition or complication.	383, 384.	No.
651.50	Quadruplet pregnancy with fetal loss and retention of one or more fetus(es), unspecified as to episode of care or not applicable.	469.	No.
651.51	Quadruplet pregnancy with fetal loss and retention of one or more fetus(es), delivered, with or without mention of antepartum condition.	370, 371, 372, 373, 374, 375.	No.
651.53	Quadruplet pregnancy with fetal loss and retention of one or more fetus(es), antepartum condition or complication.	383, 384.	No.
651.60	Other multiple pregnancy with fetal loss and retention of one or more fetus(es), unspecified as to episode of care or not applicable.	469.	No.
651.61	Other multiple pregnancy with fetal loss and retention of one or more fetus(es), delivered, with or without mention of antepartum condition.	370, 371, 372, 373, 374, 375.	No.
651.63	Other multiple pregnancy with fetal loss and retention of one or more fetus(es), antepartum condition or complication.	383, 384.	No.
759.81	Prader-Willi syndrome.	390.	No.
759.82	Marfan syndrome.	390.	No.
759.89	Other specified anomalies.	390.	No.
996.60	Infection and inflammatory reaction due to unspecified device, implant, and graft.	452, 453.	Yes.
996.61	Infection and inflammatory reaction due to cardiac device, implant, and graft.	144, 145.	Yes.
996.62	Infection and inflammatory reaction due to other vascular device, implant, and graft.	144, 145.	Yes.
996.63	Infection and inflammatory reaction due to nervous system device, implant, and graft.	34, 35.	Yes.
996.64	Infection and inflammatory reaction due to indwelling urinary catheter.	331, 332, 333.	Yes.
996.65	Infection and inflammatory reaction due to other genitourinary device, implant, and graft.	331, 332, 333.	Yes.
996.66	Infection and inflammatory reaction due to internal joint prosthesis.	249.	Yes.
996.67	Infection and inflammatory reaction due to other internal orthopedic device, implant, and graft.	249.	Yes.
996.69	Infection and inflammatory reaction due to other internal prosthetic device, implant, and graft.	452, 453.	Yes.
996.70	Other complications due to unspecified device, implant, and graft.	452, 453.	Yes.
996.71	Other complications due to heart valve prosthesis.	144, 145.	Yes.
996.72	Other complications due to other cardiac device, implant, and graft.	144, 145.	Yes.
996.73	Other complications due to renal dialysis device, implant, and graft.	144, 145.	Yes.
996.74	Other complications due to other vascular device, implant, and graft.	144, 145.	Yes.
996.75	Other complications due to nervous system device, implant, and graft.	34, 35.	Yes.
996.76	Other complications due to genitourinary device, implant, and graft.	331, 332, 333.	Yes.
996.77	Other complications due to internal joint prosthesis.	249.	Yes.
996.78	Other complications due to other internal orthopedic device, implant, and graft.	249.	Yes.
996.79	Other complications due to other internal prosthetic device, implant, and graft.	452, 453.	Yes.
V23.7	Insufficient prenatal care.	469.	Yes.
V30.00	Single liveborn, born in hospital, delivered without mention of cesarean section.	391.	No.
V30.01	Single liveborn, born in hospital, delivered by cesarean section.	391.	No.
V31.00	Twin, mate liveborn, born in hospital, delivered without mention of cesarean section.	391.	No.
V31.01	Twin, mate liveborn, born in hospital, delivered by cesarean section.	391.	No.
V32.00	Twin, mate stillborn, born in hospital, delivered without mention of cesarean section.	391.	No.
V32.01	Twin, mate stillborn, born in hospital, delivered by cesarean section.	391.	No.
V33.00	Twin, unspecified, born in hospital, delivered without mention of cesarean section.	391.	No.
V33.01	Twin, unspecified, born in hospital, delivered by cesarean section.	391.	No.
V34.00	Other multiple, mates all liveborn, born in hospital, delivered without mention of cesarean section.	391.	No.
V34.01	Other multiple, mates all liveborn, born in hospital, delivered by cesarean section.	391.	No.
V35.00	Other multiple, mates all stillborn, born in hospital, delivered without mention of cesarean section.	391.	No.
V35.01	Other multiple, mates all stillborn, born in hospital, delivered by cesarean section.	391.	No.
V36.00	Other multiple, mates live- and stillborn, born in hospital, delivered without mention of cesarean section.	391.	No.
V36.01	Other multiple, mates live- and stillborn, born in hospital, delivered by cesarean section.	391.	No.
V37.00	Other multiple, unspecified, born in hospital, delivered without mention of cesarean section.	391.	No.
V37.01	Other multiple, unspecified, born in hospital, delivered by cesarean section.	391.	No.
V39.00	Unspecified, born in hospital, delivered without mention of cesarean section.	391.	No.
V39.01	Unspecified, born in hospital, delivered by cesarean section.	391.	No.

TABLE 6B—NEW PROCEDURE CODES

Procedure Code	Description	DRG
11.75	Radial Keratotomy ¹	42; 442, 443
11.76	Epikeratophakia ¹	40, 41; 442, 443
31.95	Tracheoesophageal fistulization	Non-OR
32.01	Endoscopic excision or destruction of lesion or tissue of bronchus	Non-OR, 412
32.09	Other local excision or destruction of lesion or tissue of bronchus	75
32.28	Endoscopic excision or destruction of lesion or tissue of lung	Non-OR, 412
38.95	Venous catheterization for renal dialysis	Non-OR
42.33	Endoscopic excision or destruction of lesion or tissue of esophagus	Non-OR, 412
43.11	Percutaneous [endoscopic] gastrostomy [PEG]	Non-OR
43.19	Other gastrostomy	Non-OR
44.43	Endoscopic control of gastric or duodenal bleeding	Non-OR
44.44	Transcatheter embolization for gastric or duodenal bleeding	Non-OR
44.49	Other control of hemorrhage of stomach or duodenum	Non-OR
45.30	Endoscopic excision or destruction of lesion of duodenum	Non-OR, 412
45.43	Endoscopic destruction of other lesion or tissue of large intestine	Non-OR, 412
46.32	Percutaneous [endoscopic] jejunostomy [PEJ]	Non-OR
46.85	Dilation of colon	Non-OR
49.31	Endoscopic excision or destruction of lesion or tissue of anus	Non-OR, 412

TABLE 6B—NEW PROCEDURE CODES—Continued

Procedure Code	Description	DRG
49.39.....	Other local excision or destruction of lesion or tissue of anus.....	157, 158; 267
51.10.....	Endoscopic retrograde cholangiopancreatography [ERCP].....	Non-OR, 412
51.14.....	Other closed [endoscopic] biopsy of biliary duct or sphincter of Oddi.....	Non-OR, 412
51.15.....	Pressure measurement of sphincter of Oddi.....	Non-OR
51.64.....	Endoscopic excision or destruction of lesion of biliary ducts or sphincter of Oddi.....	Non-OR, 412
51.84.....	Endoscopic dilation of ampulla and biliary duct.....	Non-OR, 412
51.85.....	Endoscopic sphincterotomy and papillotomy.....	Non-OR, 412
51.86.....	Endoscopic insertion of nasobiliary drainage tube.....	Non-OR, 412
51.87.....	Endoscopic insertion of stent (tube) into bile duct.....	Non-OR, 412
51.88.....	Endoscopic removal of stone(s) from biliary tract.....	Non-OR
52.13.....	Endoscopic retrograde pancreatography [ERP].....	Non-OR, 412
52.14.....	Closed [endoscopic] biopsy of pancreatic duct.....	Non-OR, 412
52.21.....	Endoscopic excision or destruction of lesion or tissue of pancreatic duct.....	Non-OR, 412
52.22.....	Other excision or destruction of lesion or tissue of pancreas or pancreatic duct.....	191, 192; 292, 293
52.97.....	Endoscopic insertion of nasopancreatic drainage tube.....	Non-OR, 412
52.98.....	Endoscopic dilation of pancreatic duct.....	Non-OR, 412
57.17.....	Percutaneous cystostomy.....	Non-OR
57.18.....	Other suprapubic cystostomy.....	308, 309; 344, 345; 360; 400; 406, 407; 442, 443
77.56.....	Repair of hammer toe.....	225
77.57.....	Repair of claw toe.....	225
77.58.....	Other excision, fusion, and repair of toes.....	225; 442, 443
81.40.....	Repair of hip, not elsewhere classified.....	210, 211, 212; 442, 443
81.52.....	Partial hip replacement.....	209; 292, 293; 442, 443; 471
81.53.....	Revision of hip replacement.....	209; 292, 293; 442, 443; 471
81.54.....	Total knee replacement.....	209; 442, 443; 471
81.55.....	Revision of knee replacement.....	209; 442, 443; 471
81.56.....	Total ankle replacement.....	209; 442, 443; 471
81.57.....	Replacement of joint of foot and toe.....	225; 442, 443
81.72.....	Arthroplasty of metacarpophalangeal and interphalangeal joint without implant.....	7, 8; 228; 441
81.73.....	Total wrist replacement.....	209; 442, 443
81.74.....	Arthroplasty of carpocarpal or carpometacarpal joint with implant.....	7, 8; 228; 441
81.75.....	Arthroplasty of carpocarpal or carpometacarpal joint without implant.....	7, 8; 228; 441
81.80.....	Total shoulder replacement.....	209; 442, 443
88.97.....	Magnetic resonance imaging of other and unspecified sites.....	Non-OR
88.98.....	Bone mineral density studies ¹	Non-OR
89.10.....	Intracarotid amobarbital test.....	Non-OR
89.19.....	Video and radio-telemetered electroencephalographic monitoring.....	Non-OR
94.61.....	Alcohol rehabilitation.....	436
94.62.....	Alcohol detoxification.....	Non-OR
94.63.....	Alcohol rehabilitation and detoxification.....	437
94.64.....	Drug rehabilitation.....	436
94.65.....	Drug detoxification.....	Non-OR
94.66.....	Drug rehabilitation and detoxification.....	437
94.67.....	Combined alcohol and drug rehabilitation.....	436
94.68.....	Combined alcohol and drug detoxification.....	Non-OR
94.69.....	Combined alcohol and drug rehabilitation and detoxification.....	437
97.05.....	Replacement of stent (tube) in biliary or pancreatic duct.....	Non-OR
98.51.....	Extracorporeal shockwave lithotripsy [ESWL] of the kidney, ureter and/or bladder.....	Non-OR, 323
98.52.....	Extracorporeal shockwave lithotripsy [ESWL] of the gallbladder and /or bile duct ¹	Non-OR
98.59.....	Extracorporeal shockwave lithotripsy of other sites ¹	Non-OR

¹ These procedures are not covered under Medicare. See Medicare Coverage Issues Manual 35-54; 35-81 and 50-44. Procedures potentially classified under code 98.59 will be evaluated for Medicare Coverage as they are developed.

TABLE 6C—REVISED PROCEDURE CODE TITLES AND INCLUSION TERMS THAT AFFECT DRG ASSIGNMENT

Procedure Code	Description	DRG
38.93.....	Venous catheterization, not elsewhere classified.....	No change
43.41.....	Endoscopic excision or destruction of lesion or tissue of stomach.....	Non-OR; 412
45.31.....	Other local excision of lesion of duodenum.....	No change
45.41.....	Excision of lesion or tissue of large intestine.....	No change
45.42.....	Endoscopic polypectomy of large intestine.....	Non-OR; 412
51.11.....	Endoscopic retrograde cholangiography [ERC].....	Non-OR; 412
51.12.....	Percutaneous biopsy of gall-bladder or bile ducts.....	Non-OR
51.82.....	Pancreatic sphincterotomy.....	154, 155, 156; 191, 192; 442, 443
52.92.....	Cannulation of pancreatic duct.....	No change
52.93.....	Endoscopic insertion of stent (tube) into pancreatic duct ¹	Non-OR; 412
52.94.....	Endoscopic removal of stone(s) from pancreatic duct ¹	Non-OR
52.99.....	Other operation on pancreas, not elsewhere classified ¹	170, 171; 191, 192; 442, 443
57.19.....	Other cystostomy.....	308, 309; 442, 443
57.21.....	Vesicostomy.....	308, 309; 344, 345; 360; 400; 406, 407; 442, 443
57.22.....	Revision or closure of vesicostomy.....	308, 309; 344, 345; 365; 400; 406, 407; 442, 443
77.54.....	Excision or correction of bunionette.....	No change
81.02.....	Other cervical fusion, anterior technique.....	4; 214, 215; 442, 443

TABLE 6C—REVISED PROCEDURE CODE TITLES AND INCLUSION TERMS THAT AFFECT DRG ASSIGNMENT—Continued

Procedure Code	Description	DRG
81.03.....	Other cervical fusion, posterior technique.....	4; 214, 215; 442, 443
81.04.....	Dorsal and dorsolumbar fusion, anterior technique.....	4; 214, 215; 442, 443
81.05.....	Dorsal and dorsolumbar fusion, posterior technique.....	4; 214, 215; 442, 443
81.06.....	Lumbar and lumbosacral fusion, anterior technique.....	4; 214, 215; 442, 443
81.07.....	Lumbar and lumbosacral fusion, lateral transverse process technique.....	4; 214, 215; 442, 443
81.08.....	Lumbar and lumbosacral fusion, posterior technique.....	4; 214, 215; 442, 443
81.09.....	Refusion of spine, any level or technique.....	4; 214, 215; 442, 443
81.51.....	Total hip replacement.....	209; 442, 443; 471
81.59.....	Revision of joint replacement, not elsewhere classified.....	233, 234; 442, 443
81.71.....	Arthroplasty of metacarpophalangeal and interphalangeal joint with implant.....	7, 8; 228; 441
81.79.....	Other repair of hand, fingers, and wrist.....	7, 8; 228; 441
81.81.....	Partial shoulder replacement.....	209; 442, 443
81.84.....	Total elbow replacement.....	209; 442, 443
89.68.....	Monitoring of cardiac output by other technique.....	Non-OR

¹ The notes for code 52.99 were revised to include the open procedures formerly included in codes 52.93 and 52.94, thus adding 52.99 to DRGs 170 and 171.

TABLE 6D—EXPANDED DIAGNOSIS CODES THAT ARE NO LONGER ACCEPTED IN GROUPER ¹

Diagnosis Code	Description	DRG
088.8.....	Other specified arthropod-borne diseases.....	423
345.0.....	Generalized nonconvulsive epilepsy.....	24, 25, 26
345.1.....	Generalized convulsive epilepsy.....	24, 25, 26
345.4.....	Partial epilepsy, with impairment or consciousness.....	24, 25, 26
345.5.....	Partial epilepsy, without mention of impairment of consciousness.....	24, 25, 26
345.6.....	Infantile spasms.....	24, 25, 26
345.7.....	Epilepsia partialis continua.....	24, 25, 26
345.8.....	Other forms of epilepsy.....	24, 25, 26
345.9.....	Epilepsy, unspecified.....	24, 25, 26
403.0.....	Hypertensive renal disease, malignant.....	331, 332, 333
403.1.....	Hypertensive renal disease, benign.....	331, 332, 333
403.9.....	Hypertensive renal disease, unspecified.....	331, 332, 333
404.0.....	Hypertensive heart and renal disease, malignant.....	134
404.1.....	Hypertensive heart and renal disease, benign.....	134
404.9.....	Hypertensive heart and renal disease, unspecified.....	134
410.0.....	Acute myocardial infarction, of anterolateral wall.....	115, 121, 122, 123
410.1.....	Acute myocardial infarction, of other anterior wall.....	115, 121, 122, 123
410.2.....	Acute myocardial infarction, of inferolateral wall.....	115, 121, 122, 123
410.3.....	Acute myocardial infarction, of inferoposterior wall.....	115, 121, 122, 123
410.4.....	Acute myocardial infarction, of other inferior wall.....	115, 121, 122, 123
410.5.....	Acute myocardial infarction, of other lateral wall.....	115, 121, 122, 123
410.6.....	True posterior wall infarction.....	115, 121, 122, 123
410.7.....	Acute myocardial infarction, subendocardial infarction.....	115, 121, 122, 123
410.8.....	Acute myocardial infarction of other specified sites.....	115, 121, 122, 123
410.9.....	Acute myocardial infarction, unspecified site.....	115, 121, 122, 123
411.8.....	Other acute and subacute forms of ischemic heart disease, unspecified.....	124, 140
759.8.....	Other specified congenital anomalies.....	390
996.6.....	Infection and inflammatory reaction due to internal prosthetic device, implant, and graft.....	452, 453
996.7.....	Other complications of internal prosthetic device, implant, and graft.....	452, 453
V30.0.....	Single liveborn, born in hospital.....	391
V31.0.....	Twin, mate liveborn, born in hospital.....	391
V32.0.....	Twin, mate stillborn, born in hospital.....	391
V33.0.....	Twin, unspecified, born in hospital.....	391
V34.0.....	Other multiple, mates all liveborn, born in hospital.....	391
V35.0.....	Other multiple, mates all stillborn, born in hospital.....	391
V36.0.....	Other multiple, mates live- and stillborn, born in hospital.....	391
V37.0.....	Other multiple unspecified, born in hospital.....	391
V39.0.....	Liveborn unspecified, born in hospital.....	391

¹ See Table 6a for New Diagnosis Codes (5 digits).

TABLE 6E—DELETED PROCEDURE CODES

Procedure Code	Description	DRG
32.0.....	Local excision or destruction of lesion or tissue of bronchus.....	75
43.1.....	Temporary gastrostomy.....	Non-OR
43.2.....	Permanent gastrostomy.....	Non-OR
49.3.....	Local excision or destruction of other lesion or tissue of anus.....	157, 158; 267
51.97.....	Therapeutic endoscopic procedures on biliary tract, oral route.....	Non-OR
52.2.....	Local excision or destruction of pancreatic lesion.....	191, 192; 292, 293
52.91.....	Endoscopic retrograde cannulation of pancreatic duct [ERCP].....	Non-OR
59.96.....	Extracorporeal shockwave lithotripsy [ESWL].....	Non-OR
81.18.....	Other fusion of toe.....	225; 442, 443
81.31.....	Arthroplasty of foot and toe with synthetic prosthesis.....	7, 8; 225; 442, 443
81.39.....	Other arthroplasty of foot and toe.....	7, 8; 225; 442, 443

TABLE 6E—DELETED PROCEDURE CODES—Continued

Procedure Code	Description	DRG
81.41.....	Total knee replacement.....	209; 442, 443; 471
81.48.....	Total ankle replacement.....	209; 442, 443; 471
81.61.....	Replacement of head of femur with use of methyl methacrylate.....	209; 292, 293; 442, 443; 471
81.62.....	Other replacement of head of femur.....	209; 292, 293; 442, 443; 471
81.63.....	Replacement of acetabulum with use of methyl methacrylate.....	209; 442, 443; 471
81.64.....	Other replacement of acetabulum.....	209; 442, 443; 471
81.69.....	Other repair of hip.....	210, 211, 212; 442, 443
81.86.....	Arthroplasty of carpals with synthetic prosthesis.....	7, 8; 228; 441
81.87.....	Other repair of wrist.....	7, 8; 228; 441
88.99.....	Magnetic resonance imaging of other and unspecified sites.....	Non-OR

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Table 6f --Additions to the CC Exclusions List

CCs that are added to the list are in Table 6f--Additions to the CC Exclusions List. Each of the principal diagnoses is shown with an asterisk, and the revisions to the CC Exclusions List are provided in an indented column immediately following the affected principal diagnosis.

*25060	34581	34551	34591	34510	34510	40311	40493
34501	34591	34561	7803	34511	34511	40391	*40290
34510	7803	34571	*34570	3452	34541	40400	40300
34511	*34511	34581	34501	3453	34551	40401	40301
34541	34501	34591	34510	34541	34561	40402	40311
34551	34510	7803	34511	34551	34571	40403	40391
34561	34511	*34550	3452	34561	34581	40411	40400
34571	3452	34501	3453	34571	34591	40412	40401
34581	3453	34510	34541	34581	*4010	40413	40402
34591	34541	34511	34551	34591	40300	40491	40403
*25061	34551	3452	34561	7803	40301	40492	40411
34501	34561	3453	34571	*34591	40311	40493	40412
34510	34571	34541	34581	34501	40391	*40201	40413
34511	34581	34551	34591	34510	40400	40300	40491
34541	34591	34561	7803	34511	40401	40301	40492
34551	7803	34571	*34571	3452	40402	40311	40493
34561	*3452	34581	34501	3453	40403	40391	*40291
34571	34501	34591	34510	34541	40411	40400	40300
34581	34510	7803	34511	34551	40412	40401	40301
34591	34511	*34551	3452	34561	40413	40402	40311
*34500	34541	34501	3453	34571	40491	40403	40391
34501	34551	34510	34541	34581	40492	40411	40400
34510	34561	34511	34551	34591	40493	40412	40401
34511	34571	3452	34561	7803	*4011	40413	40402
3452	34581	3453	34571	*3488	40300	40491	40403
3453	34591	34541	34581	34501	40301	40492	40411
34541	*3453	34551	34591	34510	40311	40493	40412
34551	34501	34561	7803	34511	40391	*40210	40413
34561	34510	34571	*34580	34541	40400	40300	40491
34571	34511	34581	34501	34551	40401	40301	40492
34581	34541	34591	34510	34561	40402	40311	40493
34591	34551	7803	34511	34571	40403	40391	*40300
7803	34561	*34560	3452	34581	40411	40400	4010
*34501	34571	34501	3453	34591	40412	40401	40200
34501	34581	34510	34541	*3489	40413	40402	40201
34510	34591	34511	34551	34501	40491	40403	40211
34511	*34540	3452	34561	34510	40492	40411	40291
3452	34501	3453	34571	34511	40493	40412	40300
3453	34510	34541	34581	34541	*4019	40413	40301
34541	34511	34551	34591	34551	40300	40491	40311
34551	3452	34561	7803	34561	40301	40492	40391
34561	3453	34571	*34581	34571	40311	40493	40400
34571	34541	34581	34501	34581	40391	*40211	40401
34581	34551	34591	34510	34591	40400	40300	40402
34591	34561	7803	34511	*34989	40401	40301	40403
7803	34571	*34561	3452	34501	40402	40311	40411
*34510	34581	34501	3453	34510	40403	40391	40412
34501	34591	34510	34541	34511	40411	40400	40413
34510	7803	34511	34551	34541	40412	40401	40491
34511	*34541	3452	34561	34551	40413	40402	40492
3452	34501	3453	34571	34561	40491	40403	40493
3453	34510	34541	34581	34571	40492	40411	40501
34541	34511	34551	34591	34581	40493	40412	40509
34551	3452	34561	7803	34591	*40200	40413	*40301
34561	3453	34571	*34590	*3499	40300	40491	4010
34571	34541	34581	34501	34501	40301	40492	40200

40201	40412	40291	40491	40301	40493	40391	40401
40211	40413	40300	40492	40311	40501	40400	40402
40291	40491	40301	40493	40391	40509	40401	40403
40300	40492	40311	40501	40400	*40490	40402	40411
40301	40493	40391	40509	40401	4010	40403	40412
40311	40501	40400	*40403	40402	40200	40411	40413
40391	40509	40401	4010	40403	40201	40412	40491
40400	*40390	40402	40200	40411	40211	40413	40492
40401	4010	40403	40201	40412	40291	40491	40493
40402	40200	40411	40211	40413	40300	40492	*40511
40403	40201	40412	40291	40491	40301	40493	40300
40411	40211	40413	40300	40492	40311	40501	40301
40412	40291	40491	40301	40493	40391	40509	40311
40413	40300	40492	40311	40501	40400	*40493	40391
40491	40301	40493	40391	40509	40401	4010	40400
40492	40311	40501	40400	*40412	40402	40200	40401
40493	40391	40509	40401	4010	40403	40201	40402
40501	40400	*40401	40402	40200	40411	40211	40403
40509	40401	4010	40403	40201	40412	40291	40411
*40310	40402	40200	40411	40211	40413	40300	40412
4010	40403	40201	40412	40291	40491	40301	40413
40200	40411	40211	40413	40300	40492	40311	40491
40201	40412	40291	40491	40301	40493	40391	40492
40211	40413	40300	40492	40311	40501	40400	40493
40291	40491	40301	40493	40391	40509	40401	*40519
40300	40492	40311	40501	40400	*40491	40402	40300
40301	40493	40391	40509	40401	4010	40403	40301
40311	40501	40400	*40410	40402	40200	40411	40311
40391	40509	40401	4010	40403	40201	40412	40391
40400	*40391	40402	40200	40411	40211	40413	40400
40401	4010	40403	40201	40412	40291	40491	40401
40402	40200	40411	40211	40413	40300	40492	40402
40403	40201	40412	40291	40491	40301	40493	40403
40411	40211	40413	40300	40492	40311	40501	40411
40412	40291	40491	40301	40493	40391	40509	40412
40413	40300	40492	40311	40501	40400	*40501	40413
40491	40301	40493	40391	40509	40401	40300	40491
40492	40311	40501	40400	*40413	40402	40301	40492
40493	40391	40509	40401	4010	40403	40311	40493
40501	40400	*40402	40402	40200	40411	40391	*40591
40509	40401	4010	40403	40201	40412	40400	40300
*40311	40402	40200	40411	40211	40413	40401	40301
4010	40403	40201	40412	40291	40491	40402	40311
40200	40411	40211	40413	40300	40492	40403	40391
40201	40412	40291	40491	40301	40493	40411	40400
40211	40413	40300	40492	40311	40501	40412	40401
40291	40491	40301	40493	40391	40509	40413	40402
40300	40492	40311	40501	40400	*40492	40491	40403
40301	40493	40391	40509	40401	4010	40492	40411
40311	40501	40400	*40411	40402	40200	40493	40412
40391	40509	40401	4010	40403	40201	*40509	40413
40400	*40400	40402	40200	40411	40211	40300	40491
40401	4010	40403	40201	40412	40291	40301	40492
40402	40200	40411	40211	40413	40300	40311	40493
40403	40201	40412	40291	40491	40301	40391	*40599
40411	40211	40413	40300	40492	40311	40400	40300

40301	41081	4130	41011	41061	41181	*41061	41041
40311	41091	4131	41021	41071	41189	41001	41051
40391	4111	4139	41031	41081	4130	41011	41061
40400	41181	*41020	41041	41091	4131	41021	41071
40401	41189	41001	41051	4111	4139	41031	41081
40402	4130	41011	41061	41181	*41051	41041	41091
40403	4131	41021	41071	41189	41001	41051	4111
40411	4139	41031	41081	4130	41011	41061	41181
40412	*41010	41041	41091	4131	41021	41071	41189
40413	41001	41051	4111	4139	41031	41081	4130
40491	41011	41061	41181	*41041	41041	41091	4131
40492	41021	41071	41189	41001	41051	4111	4139
40493	41031	41081	4130	41011	41061	41181	*41072
*41000	41041	41091	4131	41021	41071	41189	41001
41001	41051	4111	4139	41031	41081	4130	41011
41011	41061	41181	*41031	41041	41091	4131	41021
41021	41071	41189	41001	41051	4111	4139	41031
41031	41081	4130	41011	41061	41181	*41062	41041
41041	41091	4131	41021	41071	41189	41001	41051
41051	4111	4139	41031	41081	4130	41011	41061
41061	41181	*41021	41041	41091	4131	41021	41071
41071	41189	41001	41051	4111	4139	41031	41081
41081	4130	41011	41061	41181	*41052	41041	41091
41091	4131	41021	41071	41189	41001	41051	4111
4111	4139	41031	41081	4130	41011	41061	41181
41181	*41011	41041	41091	4131	41021	41071	41189
41189	41001	41051	4111	4139	41031	41081	4130
4130	41011	41061	41181	*41042	41041	41091	4131
4131	41021	41071	41189	41001	41051	4111	4139
4139	41031	41081	4130	41011	41061	41181	*41080
*41001	41041	41091	4131	41021	41071	41189	41001
41001	41051	4111	4139	41031	41081	4130	41011
41011	41061	41181	*41032	41041	41091	4131	41021
41021	41071	41189	41001	41051	4111	4139	41031
41031	41081	4130	41011	41061	41181	*41070	41041
41041	41091	4131	41021	41071	41189	41001	41051
41051	4111	4139	41031	41081	4130	41011	41061
41061	41181	*41022	41041	41091	4131	41021	41071
41071	41189	41001	41051	4111	4139	41031	41081
41081	4130	41011	41061	41181	*41060	41041	41091
41091	4131	41021	41071	41189	41001	41051	4111
4111	4139	41031	41081	4130	41011	41061	41181
41181	*41012	41041	41091	4131	41021	41071	41189
41189	41001	41051	4111	4139	41031	41081	4130
4130	41011	41061	41181	*41050	41041	41091	4131
4131	41021	41071	41189	41001	41051	4111	4139
4139	41031	41081	4130	41011	41061	41181	*41081
*41002	41041	41091	4131	41021	41071	41189	41001
41001	41051	4111	4139	41031	41081	4130	41011
41011	41061	41181	*41040	41041	41091	4131	41021
41021	41071	41189	41001	41051	4111	4139	41031
41031	41081	4130	41011	41061	41181	*41071	41041
41041	41091	4131	41021	41071	41189	41001	41051
41051	4111	4139	41031	41081	4130	41011	41061
41061	41181	*41030	41041	41091	4131	41021	41071
41071	41189	41001	41051	4111	4139	41031	41081

41091	4131	*4220	4290	*45989	42971	49321	*53321
4111	4139	42971	4294	40300	42979	*49391	9981
41181	*41092	42979	4295	40301	*4911	49320	*53340
41189	41001	*42290	4296	40311	49320	49321	9981
4130	41011	42971	42971	40391	49321	*5178	*53341
4131	41021	42979	42979	40400	*4912	49320	9981
4139	41031	*42291	42981	40401	49320	49321	*53360
*41082	41041	42971	42982	40402	49321	*51889	9981
41001	41051	42979	7450	40403	*4918	49320	*53361
41011	41061	*42292	74510	40411	49320	49321	9981
41021	41071	42971	74511	40412	49321	*5198	*53400
41031	41081	42979	74512	40413	*4919	49320	9981
41041	41091	*42293	74519	40491	49320	49321	*53401
41051	4111	42971	7452	40492	49321	*5199	9981
41061	41181	42979	7453	40493	*4920	49320	*53420
41071	41189	*42299	7454	41001	49320	49321	9981
41081	4130	42971	74560	41011	49321	*5308	*53421
41091	4131	42979	74569	41021	*4928	9981	9981
4111	4139	*42789	7457	41031	49320	*53100	*53440
41181	*4110	4260	*42979	41041	49321	9981	9981
41189	41181	42612	3980	41051	*49300	*53101	*53441
4130	41189	42613	4220	41061	49320	9981	9981
4131	*4111	42653	42290	41071	49321	*53120	*53460
4139	41181	42654	42291	41081	*49301	9981	9981
*41090	41189	4266	42292	41091	49320	*53121	*53461
41001	*41181	4267	42293	41181	49321	9981	9981
41011	4110	42681	42299	41189	*49310	*53140	*5350
41021	4111	42689	4290	42971	49320	9981	9981
41031	41181	4269	4294	42979	49321	*53141	*5693
41041	41189	4270	4295	*4599	*49311	9981	9981
41051	4130	4271	4296	40300	49320	*53160	*5780
41061	4131	4272	42971	40301	49321	9981	9981
41071	4139	42731	42979	40311	*49320	*53161	*5781
41081	*41189	42732	42981	40391	4911	9981	9981
41091	4110	42741	42982	40400	4912	*53200	*5789
4111	4111	42742	7450	40401	4918	9981	9981
41181	41181	*4290	74510	40402	4919	*53201	*7450
41189	41189	42971	74511	40403	4928	9981	42971
4130	4130	42979	74512	40411	49301	*53220	42979
4131	4131	*4294	74519	40412	49311	9981	*74510
4139	4139	42971	7452	40413	49320	*53221	42971
*41091	*4130	42979	7453	40491	49321	9981	42979
41001	41181	*4295	7454	40492	49391	*53240	*74511
41011	41189	42971	74560	40493	*49321	9981	42971
41021	*4131	42979	74569	41001	4911	*53241	42979
41031	41181	*4296	7457	41011	4912	9981	*74512
41041	41189	42971	*42981	41021	4918	*53260	42971
41051	*4139	42979	42971	41031	4919	9981	42979
41061	41181	*42971	42979	41041	4928	*53261	*74519
41071	41189	3980	*42982	41051	49301	9981	42971
41081	*4148	4220	42971	41061	49311	*53300	42979
41091	41181	42290	42979	41071	49320	9981	*7452
4111	41189	42291	*4560	41081	49321	*53301	42971
41181	*4149	42292	9981	41091	49391	9981	42979
41189	41181	42293	*45620	41181	*49390	*53320	*7453
4130	41189	42299	9981	41189	49320	9981	42971

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42979	7452	74684	99661	99665	*99659	99662	99659
*7454	7453	74686	99662	99669	99660	99669	99660
42971	7454	74711	99669	99670	99661	99670	99661
42979	74560	74722	99670	99676	99662	99671	99662
*7455	74569	*75989	99672	99679	99663	99672	99663
42971	7457	42971	99674	*99639	99664	99674	99664
42979	74601	42979	99679	99660	99665	99679	99665
*74560	74602	74100	*99602	99664	99666	*99663	99666
42971	7461	74101	99660	99665	99667	9962	99667
42979	7462	74102	99661	99669	99669	99660	99669
*74561	7463	74103	99662	99670	99670	99663	99670
42971	7464	74190	99669	99676	99671	99669	99671
42979	7465	74191	99670	99679	99672	99670	99672
*74569	7466	74192	99671	*9964	99673	99675	99673
42971	7467	74193	99672	99660	99674	99679	99674
42979	74681	7450	99674	99666	99675	*99664	99675
*7457	74682	74510	99679	99667	99676	99630	99676
42971	74683	74511	*99603	99669	99677	99639	99677
42979	74684	74512	99660	99670	99678	99660	99678
*7458	74686	74519	99661	99677	99679	99664	99679
42971	74711	7452	99662	99678	*99660	99665	*99670
42979	74722	7453	99669	99679	99659	99669	99600
*7459	*75982	7454	99670	*99651	99660	99670	99659
42971	42971	74560	99674	99660	99661	99676	99660
42979	42979	74569	99679	99669	99662	99679	99661
*74689	74100	7457	*99609	99670	99663	*99665	99662
42971	74101	74601	99660	99679	99664	99630	99663
42979	74102	74602	99661	*99652	99665	99639	99664
*7469	74103	7461	99662	99660	99666	99660	99665
42971	74190	7462	99669	99661	99667	99664	99666
42979	74191	7463	99670	99662	99669	99665	99667
*74789	74192	7464	99671	99663	99670	99669	99669
42971	74193	7465	99672	99665	99671	99670	99670
42979	7450	7466	99674	99666	99672	99676	99671
*7479	74510	7467	99679	99667	99673	99679	99672
42971	74511	74681	*9961	99669	99674	*99666	99673
42979	74512	74682	99660	99670	99675	9964	99674
*7597	74519	74683	99661	99671	99676	99660	99675
42971	7452	74684	99662	99672	99677	99666	99676
42979	7453	74686	99669	99673	99678	99667	99677
*75981	7454	74711	99670	99674	99679	99669	99678
42971	74560	74722	99671	99675	*99661	99670	99679
42979	74569	*7724	99672	99676	99600	99677	*99671
74100	7457	9981	99673	99677	99660	99678	99600
74101	74601	*99600	99674	99678	99661	99679	99660
74102	74602	99660	99679	99679	99662	*99667	99661
74103	7461	99661	*9962	*99653	99669	9964	99662
74190	7462	99662	99660	99660	99670	99660	99669
74191	7463	99669	99663	99669	99671	99666	99670
74192	7464	99670	99669	99670	99672	99667	99671
74193	7465	99671	99670	99679	99674	99669	99672
7450	7466	99672	99675	*99654	99679	99670	99674
74510	7467	99674	99679	99660	*99662	99677	99679
74511	74681	99679	*99630	99669	99600	99678	*99672
74512	74682	*99601	99660	99670	99660	99679	99600
74519	74683	99660	99664	99679	99661	*99669	99660

99661	99677	99661	*V237
99662	99678	99662	V237
99669	99679	99663	V238
99670	*99678	99664	V239
99671	9964	99665	*V238
99672	99660	99666	V237
99674	99666	99667	*V239
99679	99667	99669	V237
*99673	99669	99670	
99600	99670	99671	
99660	99677	99672	
99661	99678	99673	
99662	99679	99674	
99669	*99679	99675	
99670	99659	99676	
99671	99660	99677	
99672	99661	99678	
99673	99662	99679	
99674	99663	*9989	
99679	99664	99660	
*99674	99665	99661	
99600	99666	99662	
99660	99667	99663	
99661	99669	99664	
99662	99670	99665	
99669	99671	99666	
99670	99672	99667	
99671	99673	99669	
99672	99674	99670	
99674	99675	99671	
99679	99676	99672	
*99675	99677	99673	
9962	99678	99674	
99660	99679	99675	
99663	*9979	99676	
99669	99660	99677	
99670	99661	99678	
99675	99662	99679	
99679	99663	*V220	
*99676	99664	V237	
99630	99665	*V221	
99639	99666	V237	
99660	99667	*V222	
99664	99669	V237	
99665	99670	*V230	
99669	99671	V237	
99670	99672	*V231	
99676	99673	V237	
99679	99674	*V232	
*99677	99675	V237	
9964	99676	*V233	
99660	99677	V237	
99666	99678	*V234	
99667	99679	V237	
99669	*9988	*V235	
99670	99660	V237	

Table 6q --Deletions to the CC Exclusions List

CCs that are deleted from the list are in Table 6q--Deletions to the CC Exclusions List. Each of the principal diagnoses is shown with an asterisk, and the revisions to the CC Exclusions List are provided in an indented column immediately following the affected principal diagnosis.

*25060	*3488	4010	4040	4106	4139	4139	*4262
3451	3451	40200	*4100	4107	*4107	*4130	42610
*25061	*3489	40201	4100	4108	4100	4118	42611
3451	3451	40211	4101	4109	4101	*4131	4262
*25080	*34989	40291	4102	4111	4102	4118	4263
3451	3451	4030	4103	4118	4103	*4139	4264
*25081	*3499	4040	4104	4130	4104	4118	42650
3451	3451	40501	4105	4131	4105	*4148	42651
*25090	*4010	40509	4106	4139	4106	4118	42652
3451	4030	*4040	4107	*4104	4107	*4149	*4263
*25091	4040	4010	4108	4100	4108	4118	42610
3451	*4011	40200	4109	4101	4109	*4260	42611
*3450	4030	40201	4111	4102	4111	42610	4262
3451	4040	40211	4118	4103	4118	42611	4263
3452	*4019	40291	4130	4104	4130	4262	4264
3453	4030	4030	4131	4105	4131	4263	42650
7803	4040	4040	4139	4106	4139	4264	42651
*3451	*40200	40501	*4101	4107	*4108	42650	42652
3451	4030	40509	4100	4108	4100	42651	*4264
3452	4040	*4041	4101	4109	4101	42652	42610
3453	*40201	4010	4102	4111	4102	*42610	42611
7803	4030	40200	4103	4118	4103	42610	4262
*3452	4040	40201	4104	4130	4104	42611	4263
3451	*40210	40211	4105	4131	4105	4262	4264
*3453	4030	40291	4106	4139	4106	4263	42650
3451	4040	4030	4107	*4105	4107	4264	42651
*3454	*40211	4040	4108	4100	4108	42650	42652
3451	4030	40501	4109	4101	4109	42651	*42650
3452	4040	40509	4111	4102	4111	42652	42610
3453	*40290	*4049	4118	4103	4118	*42611	42611
7803	4030	4010	4130	4104	4130	42610	4262
*3455	4040	40200	4131	4105	4131	42611	4263
3451	*40291	40201	4139	4106	4139	4262	4264
3452	4030	40211	*4102	4107	*4109	4263	42650
3453	4040	40291	4100	4108	4100	4264	42651
7803	*4030	4030	4101	4109	4101	42650	42652
*3456	4010	4040	4102	4111	4102	42651	*42651
3451	40200	40501	4103	4118	4103	42652	42610
3452	40201	40509	4104	4130	4104	*42612	42611
3453	40211	*40501	4105	4131	4105	42610	4262
7803	40291	4030	4106	4139	4106	42611	4263
*3457	4030	4040	4107	*4106	4107	4262	4264
3451	4040	*40509	4108	4100	4108	4263	42650
3452	40501	4030	4109	4101	4109	4264	42651
3453	40509	4040	4111	4102	4111	42650	42652
7803	*4031	*40511	4118	4103	4118	42651	*42652
*3458	4010	4030	4130	4104	4130	42652	42610
3451	40200	4040	4131	4105	4131	*42613	42611
3452	40201	*40519	4139	4106	4139	42610	4262
3453	40211	4030	*4103	4107	*4111	42611	4263
7803	40291	4040	4100	4108	4118	4262	4264
*3459	4030	*40591	4101	4109	*4118	4263	42650
3451	4040	4030	4102	4111	4111	4264	42651
3452	40501	4040	4103	4118	4118	42650	42652
3453	40509	*40599	4104	4130	4130	42651	*42653
7803	*4039	4030	4105	4131	4131	42652	42610

42611	4263	42650	4118	9966
4262	4264	42651	42610	9967
4263	42650	42652	42611	
4264	42651	*42742	4262	
42650	42652	42610	4263	
42651	*4270	42611	4264	
42652	42610	4262	42650	
*42654	42611	4263	42651	
42610	4262	4264	42652	
42611	4263	42650	*7598	
4262	4264	42651	74100	
4263	42650	42652	74101	
4264	42651	*4275	74102	
42650	42652	42610	74103	
42651	*4271	42611	74190	
42652	42610	4262	74191	
*4266	42611	4263	74192	
42610	4262	4264	74193	
42611	4263	42650	7450	
4262	4264	42651	74510	
4263	42650	42652	74511	
4264	42651	*45989	74512	
42650	42652	4030	74519	
42651	*4272	4040	7452	
42652	42610	4100	7453	
*4267	42611	4101	7454	
42610	4262	4102	74560	
42611	4263	4103	74569	
4262	4264	4104	7457	
4263	42650	4105	74601	
4264	42651	4106	74602	
42650	42652	4107	7461	
42651	*42731	4108	7462	
42652	42610	4109	7463	
*42681	42611	4118	7464	
42610	4262	42610	7465	
42611	4263	42611	7466	
4262	4264	4262	7467	
4263	42650	4263	74681	
4264	42651	4264	74682	
42650	42652	42650	74683	
42651	*42732	42651	74684	
42652	42610	42652	74686	
*42689	42611	*4599	74711	
42610	4262	4030	74722	
42611	4263	4040	*9966	
4262	4264	4100	9966	
4263	42650	4101	*9967	
4264	42651	4102	9967	
42650	42652	4103	*9979	
42651	*42741	4104	9966	
42652	42610	4105	9967	
*4269	42611	4106	*9988	
42610	4262	4107	9966	
42611	4263	4108	9967	
4262	4264	4109	*9989	

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
001	26393	19.5380	5	8	14	23	39
002	5618	20.1499	4	7	13	24	42
003	4	22.0000	12	12	12	32	34
004	4759	17.2820	4	12	12	21	15
005	48161	7.9049	3	4	6	9	6
006	1798	2.9082	1	1	2	3	59
007	6040	26.0570	3	6	13	27	11
008	4072	5.1790	1	2	7	6	24
009	2082	11.5034	2	4	7	13	24
010	18394	11.6908	2	4	5	15	14
011	4887	7.1078	1	3	8	12	20
012	24527	10.9543	2	4	7	11	16
013	5285	9.4102	3	5	8	13	21
014	326880	10.8496	3	5	8	11	10
015	150820	5.6343	2	3	4	7	19
016	13631	9.7055	2	3	5	8	12
017	5503	6.4923	2	3	5	8	12
018	12970	9.1760	2	3	5	8	12
019	10395	5.7537	1	2	4	7	12
020	6076	12.3168	2	3	4	7	12
021	781	10.6274	2	3	4	7	12
022	11966	5.7956	2	3	4	7	12
023	4070	6.8482	1	2	3	4	12
024	49400	7.8494	2	3	4	7	12
025	27296	4.7074	1	2	3	4	12
026	50	4.9400	1	2	3	4	12
027	2743	9.6952	1	2	3	4	12
028	7018	10.0865	1	2	3	4	12
029	4560	5.1252	1	2	3	4	12
030	1	1.0000	1	2	3	4	12
031	4389	6.7268	1	2	3	4	12
032	4517	3.8123	1	2	3	4	12
034	12229	9.5245	1	2	3	4	12
035	4852	5.5517	1	2	3	4	12
036	21527	3.1004	1	2	3	4	12
037	3212	4.7883	1	2	3	4	12
038	1288	2.9852	1	2	3	4	12
039	27706	2.0235	1	2	3	4	12
040	5292	3.1047	1	2	3	4	12
041	1	2.0000	1	2	3	4	12
042	24436	3.0432	1	2	3	4	12
043	327	4.5260	1	2	3	4	12
044	2326	6.7975	1	2	3	4	12
045	3221	4.3735	1	2	3	4	12
046	3356	5.9839	1	2	3	4	12
047	3101	3.9000	1	2	3	4	12
048	1	12.0000	12	12	12	12	12
049	7510	15.7061	3	7	12	19	30
050	5682	2.9509	1	2	3	4	5
051	738	3.1992	1	2	3	4	6
052	174	4.5000	1	2	3	4	8

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 ORROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
053	9210	3.2684	1	1	2	3	7
055	7887	2.7585	1	1	1	2	5
056	1429	2.5031	1	1	2	3	5
057	858	6.3998	1	1	1	2	14
059	285	2.3158	1	1	1	2	4
061	468	4.2244	1	1	1	2	10
062	1	2.0000	1	1	2	2	2
063	6462	7.6551	1	2	2	2	16
064	6336	9.6026	1	2	2	2	21
065	31177	4.1867	1	2	3	5	8
066	10667	4.1861	2	2	3	5	7
067	427	5.7237	1	2	3	7	11
068	17144	6.2170	2	2	4	7	11
069	71104	4.7479	2	2	3	6	8
070	21	4.0476	2	2	3	5	7
071	145	6.2000	2	2	3	7	11
072	800	5.1400	1	2	3	7	10
073	8610	6.0841	1	2	3	6	12
074	1	3.0000	1	2	3	7	10
075	30298	14.6712	3	6	8	18	27
076	31437	15.0462	3	6	11	18	29
077	4748	7.9307	1	7	11	18	25
078	27912	10.6460	4	7	10	13	17
079	103823	12.5184	4	7	10	15	23
080	13077	9.2054	3	6	10	11	16
081	9	12.3333	2	5	10	16	19
082	79189	9.8489	2	7	10	16	20
083	7552	8.7673	2	7	11	19	20
084	2520	5.1147	3	7	11	16	16
085	15288	9.1284	2	7	11	16	18
086	2504	6.1893	2	4	7	12	18
087	65065	8.7957	2	4	7	12	17
088	93063	7.9341	3	4	6	11	14
089	332395	9.1679	3	5	7	11	16
090	62797	6.7632	3	4	6	11	11
091	37	5.5676	3	4	6	11	11
092	8564	9.1665	3	4	6	11	11
093	2207	6.4676	3	4	6	11	17
094	8877	10.0266	3	4	6	12	12
095	1743	6.1061	3	3	5	12	20
096	208655	7.3624	3	3	5	12	13
097	50591	5.5878	3	3	5	9	10
098	14	8.3571	3	3	5	7	20
099	35981	6.0854	2	3	4	7	12
100	12505	3.5109	2	3	4	7	7
101	22367	7.4853	2	3	4	7	14
102	5689	4.7474	2	3	4	6	14
103	118	36.1271	1	2	4	6	9
104	11480	22.7637	1	13	30	46	71
105	12103	16.8642	10	10	12	26	40
106	62031	17.0455	8	11	14	19	30

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY90 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
107	41466	12.9983	7	9	10	14	20
108	5305	15.7840	5	9	12	18	29
109	11266	12.5097	1	4	12	16	26
110	68514	16.4622	6	9	12	19	31
111	18716	9.5400	5	7	9	11	15
112	103146	7.5528	5	3	5	9	15
113	33981	19.1795	2	9	14	22	37
114	8704	13.7146	6	6	10	17	27
115	5689	15.2164	3	9	13	18	26
116	47921	7.9448	6	4	6	10	15
117	5985	7.0964	2	4	5	9	14
118	10584	6.0233	3	3	4	7	13
119	4202	6.0157	1	2	3	7	14
120	23059	17.5548	1	2	3	7	14
121	139310	10.6542	3	6	12	22	37
122	125815	7.6534	4	7	12	13	18
123	66721	5.5788	2	5	7	10	13
124	86754	6.2676	1	1	3	7	14
125	106964	3.1223	1	2	5	8	13
126	3762	22.2517	5	10	19	31	43
127	530476	6.1277	3	4	6	10	15
128	31570	8.9660	4	6	8	11	14
129	8235	5.5132	1	1	2	7	13
130	60002	8.2147	2	4	7	10	15
131	30956	5.9191	1	2	3	7	11
132	17350	5.8205	1	3	4	7	11
133	7016	4.3007	1	2	3	5	8
134	36023	5.6856	2	3	4	7	10
135	7352	7.2087	2	3	5	8	14
136	1936	4.4003	1	2	3	5	8
137	2	3.0000	2	2	4	4	4
138	173867	6.3764	2	3	5	8	12
139	80336	4.2667	1	2	3	5	8
140	371768	4.8779	2	3	4	6	9
141	72875	5.8896	2	3	4	7	11
142	41214	4.1970	1	2	3	5	8
143	96969	3.6274	1	2	3	4	6
144	44108	7.8277	2	3	5	8	15
145	8234	4.5947	1	2	3	6	9
146	7466	16.2187	1	8	13	18	27
147	2799	10.7203	8	10	13	19	27
148	125312	17.7309	6	10	14	19	16
149	29140	10.8227	6	10	14	20	31
150	17687	15.2582	6	9	12	18	27
151	6914	9.2433	4	6	8	11	15
152	7793	9.8973	3	5	8	12	18
153	4078	7.3600	3	5	7	9	11
154	48511	17.6273	5	8	13	21	34
155	9022	9.6841	4	6	8	12	17
156	1	12.0000	12	13	12	12	12
157	25779	7.4432	2	3	5	9	14

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
158	21088	3.7491	1	2	3	5	7
159	13633	7.2501	2	3	6	9	13
160	15819	4.0824	1	2	4	5	7
161	32890	4.9269	1	2	3	6	10
162	47652	2.6429	1	1	2	3	5
163	29	5.0000	2	2	4	6	8
164	4270	12.9927	2	8	11	15	21
165	2872	8.2838	5	6	8	10	13
166	2531	8.5606	3	5	7	10	15
167	2774	4.9877	3	3	4	6	8
168	2359	6.3374	1	2	3	7	14
169	2622	3.1430	1	1	2	3	6
170	12505	16.9693	3	7	12	21	34
171	2385	8.3140	2	4	7	10	16
172	30822	10.6293	2	4	7	13	22
173	5414	6.0207	1	4	7	13	22
174	134572	7.2722	2	4	6	9	13
175	34740	4.8612	2	3	4	6	8
176	11915	7.8849	3	4	6	9	15
177	18417	6.4592	3	4	5	8	11
178	9311	4.8319	2	3	4	6	8
179	7321	9.9063	3	5	7	10	15
180	55665	7.9124	2	4	6	9	11
181	26584	5.0712	2	3	4	6	8
182	240706	6.4427	2	3	4	6	9
183	95154	4.5541	2	2	3	5	8
184	58	4.2759	1	2	3	5	8
185	4190	6.4174	1	2	3	5	8
186	2	2.0000	1	2	2	3	5
187	1756	3.2027	1	1	2	3	5
188	35974	7.5470	2	3	4	6	9
189	11765	4.2564	1	2	3	5	8
190	171	5.8246	2	3	4	6	9
191	7768	23.2084	7	11	17	26	45
192	1354	13.7260	6	10	17	26	45
193	13292	17.6045	8	10	11	16	23
194	2757	12.0022	5	8	10	15	23
195	22808	13.5967	7	8	11	16	22
196	4061	9.7030	5	7	9	12	15
197	60303	10.5198	5	6	8	12	18
198	40640	6.5438	4	6	8	12	18
199	3424	15.3823	5	8	12	18	29
200	2091	14.4974	3	6	10	19	29
201	4916	13.4493	2	5	9	17	28
202	14423	10.0648	2	4	7	12	20
203	29987	9.8767	2	4	6	10	20
204	33836	8.1114	3	4	6	10	15
205	19670	9.5919	2	4	6	10	15
206	3639	5.4086	1	4	6	12	19
207	35434	7.4519	2	4	6	12	11
208	17229	4.4990	1	2	4	9	14

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRO	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
209	206383	12.7093	7	9	11	14	19
210	92997	15.5039	7	9	12	17	26
211	45414	11.4867	6	8	10	13	17
212	11	8.0909	3	5	8	9	10
213	5373	13.9001	4	6	10	17	28
214	26392	13.9407	5	7	11	16	25
215	33568	9.7594	4	5	11	16	15
216	4877	13.8253	2	4	10	18	30
217	14593	23.0136	3	8	15	29	49
218	12381	11.0259	3	5	8	13	21
219	16882	6.4506	2	4	5	8	11
220	5	22.2000	4	4	5	7	9
221	3898	10.0103	2	4	7	12	20
222	7912	5.2380	2	4	4	7	11
223	15518	5.9844	1	2	4	7	11
224	8628	8.5778	1	2	3	4	6
225	14709	4.9118	1	2	3	5	11
226	4577	10.7927	1	2	3	5	23
227	8272	4.2736	1	2	3	5	9
228	5355	4.1692	1	2	3	4	8
229	4163	2.6418	1	1	2	3	5
230	2968	7.1055	1	2	3	4	15
231	6664	6.3776	1	2	3	7	14
232	740	7.1014	1	1	3	9	18
233	5854	12.4277	3	5	9	15	25
234	6094	6.1062	2	3	5	8	12
235	6500	13.8725	2	4	8	15	33
236	3756	10.0519	2	4	7	12	19
237	1820	6.1335	2	4	5	7	11
238	5438	14.4456	4	6	11	18	29
239	5886	10.3527	3	5	8	13	20
240	10718	9.7551	3	4	7	12	19
241	5816	6.4029	2	3	5	8	12
242	2321	11.5511	3	5	8	15	24
243	152108	6.9208	1	2	3	9	13
244	11491	7.6643	1	2	3	9	14
245	7970	5.6339	1	2	3	7	11
246	2170	6.0226	1	2	3	7	11
247	10137	5.0982	1	2	3	6	10
248	6839	5.9905	1	2	3	7	11
249	5649	6.3206	1	2	3	8	13
250	3725	6.8027	1	2	3	8	13
251	5004	9.4680	1	1	2	4	7
252	2	5.0000	1	1	2	4	7
253	16032	8.8883	2	3	6	10	17
254	16940	5.1848	2	2	4	6	10
255	1	2.0000	2	2	4	2	2
256	9057	5.6629	1	2	4	2	11
257	27872	6.5715	3	4	5	8	11
258	31986	4.8970	2	3	4	6	8
259	3411	7.5427	2	3	4	9	16

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
260	4268	3.3116	1	2	3	4	6
261	4371	3.0217	1	2	2	4	5
262	3513	2.6496	1	1	2	3	5
263	29386	22.5671	6	9	15	27	45
264	7028	13.6653	3	6	10	17	28
265	5411	10.9115	2	5	7	13	23
266	6464	4.8436	2	3	3	6	10
267	567	4.6349	1	2	3	5	9
268	1904	4.1686	1	1	2	4	9
269	9714	12.9413	1	5	2	16	27
270	6716	4.8691	2	3	3	6	10
271	17177	11.7595	1	2	2	6	22
272	6678	9.7549	3	6	8	14	19
273	3276	7.6947	3	5	7	12	15
274	4074	10.0751	2	4	6	12	21
275	734	6.5163	2	3	4	7	11
276	1140	5.0860	1	2	3	6	10
277	55693	9.0300	1	2	4	11	16
278	27739	6.7390	3	4	6	11	16
279	9	4.7778	3	4	6	8	12
280	13009	6.8689	2	3	4	6	13
281	9871	4.6046	2	2	3	6	13
283	6069	7.7860	1	2	3	6	15
284	3478	4.9687	1	2	3	6	15
285	3717	23.1560	1	10	16	28	45
286	1546	13.7419	6	7	10	16	26
287	7836	20.7377	5	8	13	23	42
288	515	11.7825	5	5	7	10	26
289	3793	6.9238	3	3	4	7	14
290	9094	4.6078	2	2	3	5	8
291	194	2.2474	1	1	2	3	4
292	5129	18.4075	1	4	7	22	35
293	966	8.9193	2	3	6	11	16
294	100709	7.6569	2	4	6	9	13
295	3211	6.1155	2	3	5	7	11
296	187031	8.7305	2	4	6	10	16
297	56224	5.7147	2	3	4	7	10
298	81	6.3333	1	2	3	6	11
299	929	7.8122	1	3	5	9	15
300	10826	9.6271	1	3	5	12	18
301	3020	6.0381	2	3	5	7	11
302	6147	18.2583	2	7	12	22	32
303	16087	14.9792	7	10	15	27	38
304	14727	14.6942	4	7	11	18	28
305	6079	7.7945	4	5	7	10	14
306	11581	10.2914	2	3	5	9	19
307	6133	5.6835	2	3	4	7	10
308	8579	10.3495	2	4	7	13	21
309	5039	4.9903	1	2	3	7	10
310	33668	6.3068	1	2	3	6	12
311	28035	3.1993	1	2	3	4	6

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
312	4100	5.9615	1	2	4	7	12
313	3153	3.2363	1	1	2	4	7
314	3	5.3333	2	2	3	4	11
315	27941	14.1597	2	4	9	17	30
316	39810	9.4892	2	4	7	12	19
317	1570	3.3949	1	1	2	4	6
318	7680	9.2819	1	3	6	12	20
319	1697	4.8338	1	1	3	5	9
320	143597	8.3053	3	5	7	10	15
321	39565	6.3620	3	4	5	8	11
322	73	5.6164	2	3	5	7	12
323	25738	4.2619	1	2	3	5	9
324	16484	2.8419	1	1	2	3	5
325	10962	6.1449	1	3	5	7	12
326	5742	4.0373	1	2	3	5	9
327	9	3.2222	1	1	2	4	7
328	1991	5.5932	1	2	4	7	11
329	696	2.9239	1	1	2	4	6
330	2	4.0000	1	3	5	7	12
331	26738	7.7409	2	3	5	8	16
332	9355	4.6817	1	3	5	8	16
333	369	7.8551	1	3	5	8	16
334	10381	11.8383	6	8	10	14	19
335	8532	6.9596	6	7	10	14	19
336	101077	7.0463	3	4	5	8	12
337	107610	4.6772	3	4	5	7	14
338	10581	5.8946	3	4	5	7	14
339	5582	4.2057	1	1	2	4	9
340	5	3.4000	1	3	3	4	8
341	1895	4.8483	1	3	4	6	8
342	853	3.2532	1	1	2	3	8
343	3589	7.2056	1	4	5	8	12
344	2275	5.130	1	2	4	7	12
345	10297	8.4020	1	3	5	8	12
346	2380	3.640	1	1	2	3	8
347	5556	5.622	1	2	4	7	11
348	3909	2.9724	1	1	2	3	8
349	6998	6.0088	1	3	5	7	10
350	9	2.667	1	1	2	3	5
351	1097	4.7101	1	2	3	5	9
352	2066	13.9429	6	8	11	16	25
353	7362	9.7275	5	6	8	11	16
354	7159	6.1084	4	5	6	7	9
355	23975	5.3994	3	4	5	7	8
356	6803	13.3951	6	7	10	16	24
357	15596	8.2002	4	5	7	9	13
358	27351	5.6877	4	4	5	6	8
359	4790	6.0562	1	2	3	5	11
360	462	4.8974	1	1	2	3	5
361	30	1.7333	1	1	1	2	2
362	4286	5.5485	1	2	3	5	11

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
364	4439	3.4246	1	1	2	4	7
365	3551	12.3616	3	5	8	15	26
366	5581	10.5356	2	3	7	13	23
367	1501	4.4350	1	1	3	5	9
368	1546	7.8396	3	4	6	9	14
369	3085	4.7822	1	2	3	6	9
370	467	8.3833	4	4	6	8	14
371	706	4.9093	3	4	4	5	8
372	278	4.2878	2	2	3	4	6
373	1849	2.5219	1	2	2	3	4
374	288	2.9063	2	2	2	3	4
375	7	9.5714	2	2	3	11	11
376	94	4.1702	1	1	1	4	8
377	30	7.7667	1	1	3	7	10
378	125	4.5600	3	3	4	5	7
379	244	2.6557	1	1	2	3	5
380	76	2.8553	1	1	2	3	5
381	296	2.2804	1	1	1	2	3
382	87	1.7586	1	1	1	1	3
383	797	4.9403	1	1	2	4	7
384	118	3.3644	1	1	1	1	3
385	4	20.7500	1	1	1	1	3
386	1	10.0000	10	10	10	10	63
389	26	12.9231	2	3	5	7	10
390	29	7.0345	1	1	1	2	7
391	1	7.0000	1	1	1	1	7
392	2555	18.5202	6	7	12	21	32
393	3	36.6667	7	7	9	9	34
394	2345	10.5527	1	1	6	12	23
395	73654	6.5835	1	1	5	9	13
396	53	2.4340	1	1	2	3	5
397	10330	7.7293	2	3	5	9	15
398	12239	9.1821	3	4	6	11	18
399	2737	5.9569	1	2	2	7	11
400	7960	15.1925	4	6	11	16	32
401	6383	8.1141	3	6	11	20	33
402	3682	12.3698	1	2	3	8	13
403	24380	6.6568	2	5	9	16	26
404	7384	16.1879	1	3	5	9	14
406	3939	8.3764	4	7	12	21	32
407	1764	6.7635	2	4	7	10	15
408	10842	10.6681	1	2	4	7	15
409	8947	3.4776	2	4	6	14	23
410	135537	3.4776	1	2	3	4	6
411	531	2.9223	1	1	2	3	6
412	373	11.1317	1	1	2	3	6
413	10418	7.1910	1	1	2	3	6
414	3575	21.7509	2	4	8	14	24
415	24841	10.6235	1	2	5	9	15
416	106864	6.7436	2	3	5	8	13
417	39		2	4	6	7	14

TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
418	11456	8.6144	3	4	7	11	16
419	15860	7.7882	2	4	6	9	15
420	4663	5.9445	2	3	5	7	11
421	14409	5.6390	2	3	5	7	10
422	102	4.8137	2	2	4	6	9
423	6363	11.6035	3	5	8	14	23
424	3422	24.1642	3	8	15	27	49
425	15991	6.5508	2	3	4	8	13
426	9476	8.0496	2	3	6	10	17
427	2127	8.2261	2	3	6	10	17
428	1254	10.6164	1	3	7	13	22
429	30633	12.3370	3	4	7	13	22
430	61090	12.8490	3	5	9	16	26
431	409	9.0611	2	3	6	11	18
432	637	7.8838	1	2	4	6	12
433	5209	5.0035	1	2	3	6	10
434	16479	8.4696	2	3	6	10	18
435	19606	7.4311	2	3	5	8	18
436	4221	15.9123	3	7	15	25	29
437	9335	17.2863	4	9	17	26	30
438	1242	13.3398	1	3	7	15	23
439	7491	17.6641	3	6	11	22	33
440	1006	4.5974	1	1	2	5	9
441	43407	9.9377	1	2	6	12	22
442	14365	6.5832	1	2	4	9	14
443	3860	7.2153	1	2	5	9	14
444	2789	5.1660	1	2	4	6	9
445	1	1.0000	1	1	1	1	1
446	2842	3.5943	1	1	1	1	1
447	1	2.0000	1	1	1	1	1
448	32433	6.4051	1	2	3	4	7
449	11012	3.9457	1	1	2	2	5
450	10	3.0000	1	1	2	2	5
451	23294	6.9297	1	2	3	4	7
452	10130	4.3631	1	2	3	4	7
453	5086	7.1891	1	2	3	4	7
454	1744	4.1726	1	2	3	4	7
455	240	13.3250	1	2	3	4	7
456	137	6.3065	1	1	1	1	1
457	1914	23.8072	5	10	18	30	48
458	1017	15.4738	3	6	10	19	33
459	2339	9.4361	2	4	7	11	18
460	8303	5.2579	2	1	2	3	5
461	6358	18.8877	5	9	16	25	36
462	9718	7.1176	2	3	5	9	14
463	3638	4.5709	1	2	3	4	7
464	838	2.7757	1	1	2	3	5
465	5112	5.2162	1	1	2	3	5
466	5171	4.1058	1	1	2	3	5
467	70101	19.5586	3	9	14	24	39
468	5027	17.8705	9	11	15	21	29

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TABLE 7A - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V6.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
472	247	34.3441	1	11	26	46	70
473	8320	16.6238	2	4	10	25	40
474	12393	49.0676	14	24	38	59	92
475	37755	14.3742	2	6	11	18	31
476	11122	19.4035	8	11	15	21	28
477	39021	10.9720	1	3	8	13	22

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY89 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
001	26393	19.5380	5	8	14	23	39
002	5618	20.1499	4	7	13	24	42
003	4	22.0000	12	12	12	32	32
004	4759	17.2820	4	12	12	21	34
005	48161	7.9049	3	4	6	9	15
006	1798	2.9082	1	1	2	3	6
007	5919	26.4492	3	7	13	27	60
008	4172	5.2294	1	2	3	6	11
009	2082	11.5034	2	2	7	13	24
010	18271	11.7223	2	4	8	15	24
011	5010	7.1054	1	3	5	9	14
012	24527	10.9543	2	4	7	12	20
013	5285	9.4102	3	4	8	11	16
014	92677	10.8495	3	5	8	13	21
015	150819	5.6343	2	3	4	7	10
016	13375	9.7743	3	4	7	11	19
017	5759	6.4753	2	3	5	8	12
018	12667	9.2443	2	4	6	11	18
019	10698	5.7698	2	2	4	7	11
020	6076	12.3168	1	2	4	15	25
021	781	10.6274	3	5	7	13	20
022	11966	5.7956	2	3	4	7	11
023	4070	6.8482	1	3	5	9	13
024	48518	7.8992	2	3	5	9	15
025	28178	4.7199	1	2	4	6	9
026	50	4.9400	1	2	3	6	9
027	2743	9.6952	1	1	3	12	22
028	6866	10.1764	1	3	5	12	21
029	4712	5.1543	1	2	3	7	11
030	1	1.0000	1	1	1	1	1
031	4272	6.7900	1	2	4	8	13
032	4634	3.8276	1	2	3	5	8
034	12077	9.5785	1	3	6	11	19
035	5004	5.5420	1	2	4	7	10
036	21527	3.1004	1	2	3	4	5
037	3212	4.7883	1	2	3	5	10
038	1288	2.9852	1	1	2	3	6
039	27706	2.0235	1	1	2	2	3
040	5292	3.1047	1	1	2	2	3
041	1	2.0000	2	2	2	2	2
042	24436	3.0432	1	1	2	2	3
043	327	4.5260	1	2	4	6	8
044	2326	6.7975	3	4	6	6	12
045	3221	4.3735	1	2	3	6	8
046	3286	6.0110	1	2	4	7	12
047	3171	3.9180	1	2	2	5	8
048	1	12.0000	12	12	12	12	12
049	7510	15.7061	3	7	12	19	30
050	5682	2.9509	1	2	2	3	5
051	738	3.1992	1	1	2	3	6
052	174	4.5000	1	2	3	4	8

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
053	9210	3.2684	1	1	2	3	7
055	7887	2.7585	1	1	1	2	5
056	1429	2.5031	1	1	2	3	5
057	858	6.3998	1	2	3	7	14
059	285	2.3158	1	1	1	2	4
061	468	4.2244	1	1	2	4	10
062	1	2.0000	1	2	2	2	2
063	6462	7.6551	1	2	4	8	16
064	6336	9.6026	1	2	5	11	21
065	31177	4.1867	1	2	3	5	8
066	10667	4.1881	1	2	3	5	7
067	427	5.7237	1	3	4	7	11
068	16962	6.2289	2	3	5	7	11
069	7286	4.7569	2	3	4	6	8
070	21	4.0476	2	3	4	5	7
071	145	6.2000	2	3	4	5	7
072	800	5.1400	2	3	4	6	10
073	8610	6.0841	1	2	3	7	12
074	1	3.0000	1	2	3	7	12
075	30298	14.6712	3	8	3	3	3
076	31318	15.0711	6	7	11	18	27
077	4867	7.3589	3	7	11	18	29
078	27810	10.6433	1	2	5	10	15
079	102251	12.4639	4	7	10	13	17
080	13433	9.1756	4	6	10	15	23
081	9	12.3333	3	5	7	11	16
082	78996	9.6414	2	7	10	16	19
083	7411	8.7780	2	4	7	12	20
084	2630	5.1163	3	4	7	11	16
085	15170	9.1344	2	4	7	11	16
086	2590	6.1865	2	3	7	12	18
087	62174	8.5639	2	4	5	8	12
088	92668	7.8985	2	4	7	11	16
089	329031	9.1627	3	4	6	9	14
090	64772	6.7622	3	5	7	11	16
091	37	5.5676	3	4	6	8	11
092	8433	9.1432	2	3	5	7	11
093	2283	6.5239	3	4	7	11	17
094	8769	10.0091	3	5	7	12	19
095	1783	6.1408	3	4	5	8	12
096	206870	7.3590	2	3	6	9	13
097	51815	5.5904	2	3	5	8	10
098	14	8.8571	2	3	5	7	10
099	34943	6.1061	2	3	5	8	12
100	13329	3.5072	2	3	5	8	12
101	21802	7.4585	1	2	3	4	7
102	5857	4.7348	2	2	3	4	7
103	118	36.1271	1	2	3	4	14
104	11481	22.7631	11	16	30	46	9
105	12106	16.8611	10	13	18	26	71
106	62374	17.0252	9	11	14	19	40
							30
							27

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
107	41123	12.9954	7	8	10	14	20
108	5305	15.7840	5	9	12	18	29
109	11266	12.5097	1	4	9	16	26
110	67716	16.5443	5	9	12	19	31
111	19514	9.5384	5	7	9	11	15
112	109026	7.5448	2	3	5	9	15
113	39381	19.1795	6	9	14	22	37
114	6700	13.7086	3	6	10	17	27
115	5889	15.2164	6	9	13	18	26
116	47921	7.9448	2	4	6	10	15
117	6036	7.1345	2	3	5	9	14
118	10857	6.0892	1	2	4	7	14
119	4202	6.0157	1	2	3	7	14
120	23055	17.5566	3	6	12	22	37
121	139310	10.8542	4	7	9	13	18
122	125616	7.6534	2	5	7	10	13
123	86721	5.5788	1	1	3	7	14
124	86746	6.2676	1	1	3	8	13
125	106972	3.1225	1	1	2	4	7
126	3762	22.2517	5	10	19	31	43
127	530475	8.1277	3	6	8	10	15
128	31570	8.9660	4	6	8	11	14
129	8235	5.5132	1	1	2	7	13
130	59077	8.2419	2	4	7	11	15
131	31881	5.9253	1	2	5	10	11
132	16820	5.8470	1	2	4	8	11
133	7546	4.3484	1	2	3	7	8
134	36023	5.6856	2	3	4	7	10
135	7168	7.2609	2	3	5	8	14
136	44675	4.4675	1	2	3	6	8
137	2120	3.0000	1	2	3	4	4
138	167635	6.4379	2	3	5	8	12
139	86567	4.2995	1	2	3	5	8
140	371767	4.8779	1	2	3	6	9
141	69589	5.9663	2	3	4	7	11
142	44520	4.2030	1	2	3	5	6
143	96967	3.6274	1	2	3	4	6
144	43486	7.8698	2	3	6	10	15
145	8855	4.6141	1	2	3	6	9
146	7366	16.2954	8	10	13	19	27
147	2898	10.7129	6	8	10	13	16
148	124407	17.7623	8	10	14	20	31
149	30042	10.8174	7	9	14	20	16
150	17463	15.3379	6	9	12	18	27
151	7138	9.2359	4	6	11	12	15
152	7700	9.9151	3	5	9	12	18
153	4171	7.3838	3	5	8	9	12
154	48240	17.6732	5	8	13	21	34
155	9311	9.6837	4	6	12	12	17
156	1	12.0000	12	13	12	12	12
157	25216	7.5158	3	6	6	9	14

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
158	21551	3.7607	1	2	3	5	7
159	13104	7.3636	2	4	6	9	13
160	16348	4.0938	1	2	4	5	7
161	30949	5.0507	1	2	4	5	10
162	49593	2.6550	1	1	2	3	5
163	28	5.0000	2	2	4	6	8
164	4199	13.0753	6	6	11	15	21
165	2943	8.2796	5	6	8	10	13
166	2455	8.6729	3	5	7	10	15
167	2850	4.9863	3	3	4	6	8
168	2284	6.4440	3	3	4	6	14
169	2697	3.1416	1	2	3	7	6
170	12456	17.0006	3	7	12	21	34
171	2433	8.3358	2	4	7	11	16
172	30521	10.6446	2	4	7	13	22
173	5513	6.0172	1	2	4	7	13
174	133650	7.2856	2	4	6	9	15
175	35661	4.8730	2	3	4	6	11
176	11915	7.8849	3	4	6	9	15
177	18088	6.4917	3	4	5	8	11
178	9639	4.8268	3	3	4	6	10
179	7321	9.9063	2	3	4	7	12
180	54960	7.9453	2	3	4	6	10
181	27289	5.0783	2	3	4	6	15
182	237569	6.4689	2	3	4	6	12
183	98286	4.5508	1	2	3	5	9
184	58	4.2759	1	1	2	3	7
185	4190	6.4174	1	1	2	3	13
186	2	2.0000	1	2	2	2	7
187	1756	3.2027	1	1	2	3	15
188	35692	7.5718	1	1	2	3	9
189	12047	4.2600	1	1	2	3	7
190	171	5.8246	2	3	4	5	13
191	8349	22.4912	7	11	17	28	44
192	1627	12.6023	4	7	10	15	22
193	13114	17.6609	8	10	14	21	31
194	2795	12.0376	5	8	11	16	20
195	22447	13.6038	7	9	11	15	22
196	4186	9.7217	5	7	9	12	15
197	58921	10.5945	5	6	8	12	18
198	41986	6.5652	4	5	6	8	10
199	3424	15.3823	5	6	10	13	29
200	2082	14.4909	5	6	9	12	20
201	4913	13.4492	3	5	8	12	20
202	14421	10.0647	2	4	7	10	15
203	29953	9.8765	2	4	6	9	13
204	33797	8.1109	3	4	6	10	15
205	19611	9.5992	2	4	6	9	11
206	3698	5.4367	1	2	4	7	11
207	34546	7.4960	2	4	6	9	14
208	17772	4.5028	1	2	4	6	8

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
209	210326	12.6269	7	9	11	14	19
210	90822	15.5945	7	9	12	17	26
211	47555	11.4920	6	8	10	13	17
212	11	8.0909	3	5	8	10	10
213	5373	13.9001	4	6	10	17	28
214	25604	13.9871	5	6	11	16	25
215	34541	8.7520	4	5	8	10	15
216	5283	14.6150	2	5	11	19	31
217	14593	23.0136	3	5	15	29	49
218	11815	11.1724	3	5	8	13	21
219	17286	6.4655	2	4	5	8	11
220	5	22.2000	4	4	5	7	11
221	3628	10.2530	2	4	5	7	9
222	8182	5.2878	1	2	4	13	21
223	11533	5.3273	1	2	4	7	11
224	8842	3.5939	1	2	3	6	10
225	14711	4.9119	1	2	3	4	6
226	4415	11.0168	1	2	3	5	11
227	8449	4.2822	1	2	3	14	23
228	5270	4.1958	1	2	3	5	9
229	4250	2.8398	1	1	2	4	8
230	2968	7.1055	1	1	2	3	5
231	6577	6.3731	1	1	2	3	15
232	741	7.0931	1	1	2	3	14
233	5737	12.6557	3	5	9	16	18
234	5260	6.1371	2	3	5	8	25
235	6500	13.8725	2	3	5	15	12
236	39756	10.0519	2	4	8	12	33
237	1820	6.1335	2	4	7	12	19
238	5438	14.4456	4	6	11	18	11
239	5886	10.3527	3	5	11	13	29
240	10561	9.8037	3	5	8	12	20
241	5953	6.3936	3	5	5	8	19
242	2321	11.5511	3	5	8	15	12
243	132107	6.9207	1	3	6	9	24
244	11247	7.7017	1	3	6	9	13
245	8214	5.6429	1	3	6	9	14
246	2170	6.0226	1	3	5	7	11
247	10137	5.0982	1	2	4	7	10
248	6839	5.9905	1	2	4	6	11
249	5649	6.3206	1	2	4	7	11
250	3606	5.8838	1	2	4	8	13
251	5123	3.4884	1	2	4	8	13
252	2	5.0000	1	3	5	4	7
253	15604	8.9732	3	3	7	10	17
254	17368	5.1997	2	2	6	6	10
255	1	2.0000	1	2	4	2	2
256	9057	5.6629	1	2	4	2	11
257	27154	6.6060	3	3	6	7	11
258	32704	4.9051	2	3	5	8	16
259	3325	7.6406	2	3	5	9	16

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPEE V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
260	4354	3.3204	1	2	3	4	6
261	4371	3.0217	1	2	2	4	5
262	3513	2.6496	1	1	2	3	5
263	29197	22.6294	6	9	15	27	45
264	7217	13.6464	3	6	10	17	28
265	5231	11.1158	2	3	7	13	23
266	6644	4.8471	2	2	3	6	10
267	567	4.6349	1	2	3	5	9
268	1904	4.1686	1	1	2	4	9
269	9562	13.0580	1	5	9	16	27
270	6868	4.8853	2	2	3	6	10
271	17177	11.7595	1	6	9	14	22
272	6604	9.7845	3	5	7	12	19
273	3350	7.6818	2	4	6	9	15
274	4057	10.0961	2	3	7	12	21
275	751	6.4834	1	2	3	6	11
276	1140	5.0860	1	2	4	7	10
277	55017	9.0486	3	5	7	11	16
278	28415	6.7576	3	4	6	11	12
279	9	4.7778	2	2	4	6	6
280	12755	6.9157	2	3	5	8	13
281	10125	4.6024	1	2	3	6	9
282	5978	7.8113	2	3	6	9	15
283	3569	4.9980	1	2	3	6	10
284	3717	23.1560	6	10	16	28	45
285	1546	13.7419	6	7	10	16	26
286	7836	20.7377	5	8	13	23	42
287	515	11.7825	3	5	7	10	26
288	3793	6.9238	2	3	4	7	14
289	9094	4.6078	2	2	3	5	9
290	194	2.2474	1	1	2	3	4
291	5100	18.4582	4	8	13	22	35
292	996	8.9337	2	4	7	11	16
293	100709	7.6569	3	4	6	9	13
294	3211	6.1155	2	3	5	7	11
295	184385	8.7756	2	3	5	7	11
296	58865	5.7073	2	3	4	7	10
297	81	6.3333	1	2	3	5	11
298	929	7.3122	1	2	3	6	11
299	10709	9.6661	3	4	5	9	15
300	3137	6.0389	2	3	4	7	11
301	6147	18.2583	8	10	15	22	32
302	16087	14.9792	7	9	12	17	26
303	14576	14.7610	4	7	11	18	28
304	6230	7.8053	2	4	7	10	14
305	11334	10.3893	3	5	8	13	19
306	6380	5.6881	2	3	5	7	10
307	8401	10.4666	2	3	5	7	10
308	5217	4.9845	1	2	3	5	7
309	32686	6.4000	2	3	4	7	10
310	29017	3.1986	1	1	2	3	4
311							

TABLE 78 - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRO	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
312	3985	6.0339	1	2	4	7	12
313	3268	3.2439	1	1	2	4	7
314	3	5.3333	2	2	3	4	11
315	27941	14.1597	2	4	9	17	30
316	39610	9.4892	2	4	7	12	19
317	1570	3.3949	1	1	2	4	6
318	7642	9.3037	1	3	6	12	20
319	1735	4.8352	1	1	3	5	9
320	142516	8.9238	1	1	3	10	16
321	40646	6.3645	3	4	5	8	11
322	73	5.6164	2	2	3	7	12
323	25434	4.2737	1	1	2	5	9
324	16788	2.8498	1	1	2	4	11
325	10856	6.1584	1	2	3	7	12
326	5848	4.0503	1	1	2	5	9
327	9	3.2222	1	1	2	4	7
328	1974	5.6125	1	1	2	5	9
329	713	2.9341	1	1	2	4	7
330	2	4.0000	1	1	2	4	7
331	26516	7.7600	2	3	5	10	16
332	9577	4.6997	2	3	5	10	16
333	369	7.4851	1	2	3	6	10
334	10075	11.9201	1	3	5	10	16
335	8838	8.9659	6	7	10	14	19
336	96587	7.1506	6	7	10	14	19
337	112120	4.6827	3	4	6	10	13
338	10581	5.6946	3	4	6	10	13
339	5582	4.2057	1	1	2	5	7
340	5	3.4000	1	1	2	4	7
341	16395	4.8483	1	1	2	4	7
342	853	3.2532	1	1	2	4	7
344	3589	7.2056	1	1	2	4	7
345	2275	5.9130	1	1	2	4	7
346	10239	8.4384	1	2	3	6	10
347	2438	3.6641	1	1	2	4	7
348	5439	5.7143	1	1	2	4	7
349	4026	2.9801	1	1	2	4	7
350	8998	6.0088	1	1	2	4	7
351	3	2.6667	1	1	2	4	7
352	1097	4.7101	1	1	2	4	7
353	2066	13.9429	1	2	3	5	9
354	7210	9.7942	1	2	3	5	9
355	7311	6.1179	5	6	11	16	25
356	29975	5.4394	3	5	8	11	16
357	6603	13.3951	3	4	7	10	15
358	15048	8.2814	6	7	10	14	19
359	28499	5.6932	4	5	8	11	16
360	4790	6.0562	4	5	8	11	16
361	462	4.5974	1	1	2	4	7
362	30	1.7333	1	1	2	4	7
363	4286	5.5485	1	2	3	5	9

TABLE 78 - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPEE V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
364	4439	3.4246	1	1	2	4	7
365	3551	12.3616	3	5	8	15	26
366	5564	10.5566	2	3	7	13	23
367	1518	4.4262	1	1	3	5	9
368	1546	7.6396	3	4	6	9	14
369	3085	4.7822	1	2	3	6	14
370	466	8.8927	4	4	6	8	17
371	705	4.9106	3	4	4	5	8
372	278	4.2878	2	2	3	4	4
373	1849	2.5219	1	2	3	3	4
374	289	2.8997	2	2	3	3	4
375	287	9.5714	2	2	3	11	11
376	94	4.1702	1	2	3	4	8
377	30	7.7667	1	1	3	7	10
378	125	4.5600	1	1	3	5	5
379	244	2.6557	1	1	2	3	5
380	76	2.3553	1	1	1	3	5
381	296	2.2804	1	1	1	1	3
382	87	1.7586	1	1	1	1	3
383	737	4.8403	1	1	3	6	9
384	118	3.3644	1	1	2	4	7
385	1	20.7500	1	1	1	10	63
386	1	10.0000	1	1	1	10	10
389	26	12.8231	1	3	5	23	27
390	29	7.0345	1	1	5	7	16
391	1	7.0000	1	1	7	7	17
392	255	16.5202	1	1	9	21	32
393	2345	36.6667	1	1	6	94	94
394	7356	10.3527	1	3	5	12	23
395	7356	6.6334	1	3	5	18	33
396	22	2.4340	1	1	2	3	5
397	10330	7.7293	1	3	6	9	15
398	12774	9.2018	1	4	7	11	18
399	2802	5.9451	1	2	4	7	11
400	7950	15.1925	1	6	11	18	33
401	6279	15.6785	1	6	11	20	33
402	3786	6.1017	1	5	9	16	26
403	24251	12.3952	1	5	9	16	26
404	7513	16.6728	1	7	12	21	32
406	3899	16.2896	1	7	12	21	32
407	1805	18.3773	1	7	12	21	32
408	10842	6.7685	1	4	6	14	23
409	6337	10.6691	1	4	6	14	23
410	135537	3.4776	1	2	3	4	7
411	502	3.6673	1	2	3	4	7
412	402	2.9950	1	1	3	3	7
413	10382	11.1452	1	4	6	14	23
414	3611	7.1916	1	2	3	4	7
415	24958	21.7488	1	5	15	26	43
416	106849	10.6223	2	9	15	26	43
417	39	6.7436	2	5	8	13	20

TABLE 78 - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
418	11455	8.6142	3	4	7	11	16
419	15741	7.7998	2	4	6	9	15
420	4782	5.9523	2	3	5	7	11
421	14409	5.6390	2	3	4	7	10
422	102	4.8137	2	3	4	6	9
423	6362	11.6015	3	5	8	14	23
424	3422	24.1642	3	6	15	27	49
425	15991	6.5508	2	3	4	8	13
426	9476	8.0496	2	3	6	10	17
427	2127	8.2281	2	3	6	10	17
428	1254	10.6164	1	3	7	13	22
429	30633	12.3370	3	4	7	13	22
430	61090	12.8490	3	5	9	16	26
431	409	9.0811	2	3	6	11	18
432	637	7.8838	1	2	4	9	19
433	5209	5.0035	1	2	3	6	12
434	16479	8.4696	1	2	6	10	18
435	13606	7.4311	2	3	5	8	18
436	4221	15.9123	3	7	15	25	29
437	9335	17.2863	4	9	17	26	30
439	1242	13.3398	1	3	7	15	33
440	7491	17.6641	3	6	11	22	40
441	1006	4.5974	1	1	2	5	9
442	42857	9.9555	1	2	6	12	22
443	14917	6.6517	1	2	4	9	14
444	3825	7.2214	2	3	5	9	14
445	2824	5.1831	1	2	4	6	9
446	1	1.0000	1	1	1	1	1
447	2842	3.5943	1	1	3	4	7
448	1	2.0000	1	2	2	2	2
449	32039	6.4346	1	3	5	8	12
450	11406	3.9479	1	1	3	5	8
451	10	3.0000	1	2	3	4	5
452	23110	6.9395	1	3	5	8	14
453	10313	4.3921	1	2	5	8	15
454	5031	7.2282	1	2	5	8	15
455	1799	4.1556	1	2	5	8	15
456	240	13.8250	1	2	5	8	15
457	137	6.3066	1	2	6	14	37
458	1914	23.8072	1	10	18	30	48
459	1017	15.4798	5	10	10	19	33
460	2339	9.4361	3	4	7	11	18
461	8307	5.2560	2	1	2	5	12
462	6358	18.8877	1	1	16	25	36
463	9606	7.1424	5	3	5	9	14
464	3750	4.5835	2	3	3	6	9
465	838	2.7757	1	2	2	3	5
466	5110	5.2176	1	1	2	3	5
467	5169	4.1068	1	1	2	4	8
468	70294	19.5170	3	8	14	24	38
471	5027	17.8705	9	11	15	21	29

TABLE 7B - MEDICARE PROSPECTIVE PAYMENT SYSTEM
SELECTED PERCENTILE LENGTHS OF STAY
FY88 MEDPAR UPDATE 06/89 GROUPER V7.0

DRG	NUMBER DISCHARGES	ARITHMETIC MEAN LOS	10TH PERCENTILE	25TH PERCENTILE	50TH PERCENTILE	75TH PERCENTILE	90TH PERCENTILE
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472	247	34.3441	1	11	26	46	70
473	8320	16.6238	2	4	10	25	40
474	12338	49.0676	14	24	38	59	92
475	45295	14.3648	2	6	11	18	28
476	11120	18.4045	8	11	15	21	31
477	38806	10.9883	1	3	8	13	22

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TABLE 8.—STATEWIDE AVERAGE COST-TO-CHARGE RATIOS FOR URBAN AND RURAL HOSPITALS

(Case Weighted)

State	Urban	Rural
Alabama.....	0.5349	0.5803
Alaska.....	0.6668	0.8320
Arizona.....	0.6131	0.6490
Arkansas.....	0.6351	0.6208
California.....	0.6015	0.6056
Colorado.....	0.6228	0.6764
Connecticut.....	0.7298	0.7799
Delaware.....	0.6138	0.6293
District of Columbia.....	0.6270	
Florida.....	0.5561	0.5481
Georgia.....	0.6421	0.6108
Hawaii.....	0.6139	0.7264
Idaho.....	0.7301	0.7205
Illinois.....	0.6050	0.6755
Indiana.....	0.7320	0.7460
Iowa.....	0.6600	0.7469
Kansas.....	0.6394	0.7577
Kentucky.....	0.6328	0.6035
Louisiana.....	0.6025	0.6274
Maine.....	0.7177	0.7106
Maryland.....	0.7454	0.7058
Massachusetts.....	0.6880	0.7614
Michigan.....	0.6251	0.7068
Minnesota.....	0.7048	0.7402
Mississippi.....	0.6315	0.6478
Missouri.....	0.6011	0.6381
Montana.....	0.6917	0.6958
Nebraska.....	0.6298	0.7070
Nevada.....	0.5179	0.7496
New Hampshire.....	0.7290	0.7470
New Jersey.....	0.7300	
New Mexico.....	0.6274	0.6079
New York.....	0.6480	0.7621
North Carolina.....	0.6912	0.6228
North Dakota.....	0.7878	0.7042
Ohio.....	0.6767	0.6926
Oklahoma.....	0.6151	0.6423
Oregon.....	0.6701	0.7058
Pennsylvania.....	0.5631	0.6165
Puerto Rico.....	0.5388	0.6198
Rhode Island.....	0.7645	
South Carolina.....	0.6109	0.5823
South Dakota.....	0.6280	0.6918
Tennessee.....	0.5837	0.6004
Texas.....	0.5963	0.6957
Utah.....	0.7018	0.7029
Vermont.....	0.7690	0.7130
Virginia.....	0.6229	0.6194
Washington.....	0.7146	0.7391
West Virginia.....	0.6427	0.5973
Wisconsin.....	0.7864	0.7804
Wyoming.....	0.7473	0.7852

• Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

In addition, we generally prepare a regulatory flexibility analysis that is consistent with the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 through 612), unless the Secretary certifies that a final rule will not have a significant economic impact on a substantial number of small entities. For purposes of the RFA, we consider all hospitals to be small entities.

Also, section 1102(b) of the Act requires the Secretary to prepare a regulatory impact analysis for any final rule that may have a significant impact on the operations of a substantial number of small rural hospitals. Such an analysis must conform to the provisions of section 604 of the RFA. With the exception of hospitals located in certain rural counties adjacent to urban areas, for purposes of section 1102(b) of the Act, we define a small rural hospital as a hospital with fewer than 50 beds located outside of a Metropolitan Statistical Area or New England County Metropolitan Area, as modified, for purposes of the prospective payment system, by section 601(g) of the Social Security Amendments of 1983 (Pub. L. 98-21). Section 1886(d)(8)(B) of the Act specifies that hospitals located in certain rural counties adjacent to one or more urban areas are deemed to be located in the adjacent urban area. We have identified 52 rural hospitals, some of which may be considered small, that we are classifying as urban hospitals.

It is clear that the changes being implemented in this document will affect both a substantial number of small rural hospitals as well other classes of hospitals, and the effects on some will be significant. Therefore, the discussion below, in combination with the rest of this final rule, constitutes a combined regulatory impact analysis and regulatory flexibility analysis in accordance with E.O. 12291, the RFA, and section 1102(b) of the Act.

Since we have not significantly altered our final policy from the proposed, the impact of this final rule will be virtually identical to the impact presented in our initial analysis. The only differences in this final analysis from the initial impact analysis are to reflect the availability of more recent data since publication of the proposed rule, and the receipt of public comments directed specifically at the initial impact

analysis. Thus, the following analysis revises those portions of the initial impact analysis that are affected by the availability of more recent and complete data and responds to the two comments that concerned the impact analysis.

II. Impact on Excluded Hospitals and Units

As of August 15, 1989, over 930 Medicare hospitals and nearly 1,700 units in hospitals included in the prospective payment system currently are paid on a reasonable cost basis subject to the rate-of-increase ceiling requirement of § 413.40. For cost reporting periods beginning in FY 1990, these hospitals will have their individual target amounts increased by the hospital market basket percentage increase. We are projecting an increase in the hospital market basket of 5.5 percent.

The effect this will have on affected hospitals and units will vary depending on each hospital's or unit's existing relationship of costs per discharge to its target amount, and the relative gains in productivity (efficiency) the hospital or unit is able to achieve. For hospitals and units that incur per discharge costs lower than their target amounts, the primary impact will be on the level of incentive payments made under § 413.40(d). A hospital may receive incentive payments for incurring costs that are lower than its target amount, but may not receive payments for costs that exceed the target amount. We expect the increased ceiling on payments would maintain existing incentives for economy and efficiency experienced by excluded hospitals and units.

III. Analysis of the Quantifiable Impact of Changes Affecting Rates and Payment Amounts

A. Basis and Methodology of Estimates

The data used in developing the following quantitative estimates of changes in payments presented in Table I, below, are taken from FY 1988 billing data and hospital-specific data for FY 1988 and FY 1987. Our initial impact analysis used FY 1988 MEDPAR data received through December 1988 (approximately 9.7 million discharges). This final analysis relies on FY 1988 MEDPAR data received through June 1989 (approximately 10 million discharges). Also, for purposes of the final impact analysis, we have excluded the 37 Indian Health Service hospitals that receive payments under the prospective payment system from our hospital data base. These hospitals receive their own wage index and are

Appendix A—Regulatory Impact Analysis

I. Introduction

Executive Order (E.O.) 12291 requires us to prepare and publish a regulatory impact analysis for any final rule that meets one of the E.O. criteria for a "major rule"; that is, that will be likely to result in—

- An annual effect on the economy of \$100 million or more;
- A major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or

subject to special payment policies not applicable to any other group of hospitals under the prospective payment system. Because payments to these hospitals are not representative of payments to other hospitals, including them in the impact analysis produces some distortions in our quantitative analysis. By removing them from the data base, we believe the resulting impact estimates will more accurately reflect the effect on the remainder of the prospective payment hospitals of the policy changes being implemented.

With the exception of these changes in our analytical methodology, we are conducting the same analysis in this final rule as we performed in the initial analysis. As in the initial analysis, we compare the effects of changes being implemented in this document for FY 1990 to our estimate of the payment amounts in effect for FY 1989. In addition, we have treated all hospitals in our data base as if they had the same cost reporting period; that is, a cost reporting period coinciding with the Federal fiscal year. Furthermore, our model does not take into account any prospective, behavioral changes in response to this final rule.

The tables and the discussion that follow reflect our best effort to identify and quantify the effects of the changes set forth in this document. It should be noted, however, that as a result of gaps in our data, we are unable to quantify some of the effects of the proposed rule. Also, we could not use all the hospitals in the recalibration of outlier data sets for modeling the impact analysis because in some cases the hospital-specific data necessary for constructing our impact model were missing. Data on hospital bed size and type of ownership were the data elements most frequently missing. The absent data prevented us from properly classifying and displaying these hospitals in the impact analysis. The missing data, however, did not prevent us from using the discharges from these hospitals in recalibrating the DRG weights or calculating the outlier payments that are included in the final

column of Table I showing the combined effects of all changes.

The following analysis examines the changes being implemented to the DRG weights and wage index separately. That is, all variables except those associated with the provision under examination were held constant so as to display the effects of each provision compared to the baseline (FY 1989) provisions. In the last column (column 3), we present the combined effect of all changes being implemented in this rule. That is, column 3 displays the combined effects of the previous two columns as well as the FY 1990 update factor and the updating of the outlier payment thresholds. As such, this last column is the only one in which the effects of all the quantifiable payment policy changes on simulated FY 1990 payments are reflected.

Consistent with the display of the impact presented in Table I, the following discussion is divided into two parts. The first part (columns 1 and 2) describes the effects of two major changes in this document: the annual changes to the DRG classification system and recalibration of the DRG weights required under section 1886(d)(4)(C) of the Act (including the adjustment for increased case mix); and replacement of the current wage index based on an equal blend of 1982 and 1984 wage data with a wage index based on 1984 wage data. The final section discusses the combined effect of all provisions of this rule.

Comment: One commenter suggested that the impact analysis include the effect of regulatory changes on payment to hospitals with varying proportions of Medicare utilization.

Response: We agree with the commenter that such an analysis would be useful and we have incorporated Medicare utilization as a category in our impact tables.

Comment: A few commenters suggested refining the impact analysis to include not only the effect of regulatory actions on payments to various classes

of hospitals, but also the effect on hospital operating margins.

Response: To date, our analytical efforts have been retrospective in nature; that is, they are concerned with examining the historical record in efforts to trace the impact of the prospective payment system through perceived changes in hospital behavior. Any efforts to predict providers' response to the changes in payment rules contained in this document would take the form of speculation rather than rigorous analytical prediction. Because of limited data, we are confined to making general statements based on reasoned judgment as to the impact of specific policy changes. Since we cannot predict how hospitals will change their behavior in response to these rules, we do not believe that we can reliably project future hospital profit margins based on the data available to us.

For example, we use FY 1988 billing data to estimate the impact of changes in FY 1990 payments. The latest cost data available for predicting FY 1990 profit margins are from FY 1987. Therefore, provider behavior changes in the recent past are not yet reflected in the data available to us, and future changes cannot be predicted. Moreover, our objective in an impact analysis is to access the probable direct consequences of changes being proposed or issued in final, not to evaluate the overall effects of the prospective payment system or to compare payments to expected costs.

In view of the problems we have experienced in quantifying impacts and attributing causality, we believe the approach we are taking in the impact analysis of measuring expected impacts on hospital payments is the most feasible one. We do not believe that we can reliably predict the impact of prospective payment system changes on future hospital profit margins. Therefore, we have focused our analysis on explaining the anticipated changes in hospital payment levels and the decisions that affected entities will have to consider.

TABLE I—IMPACT OF THE CHANGES BEING IMPLEMENTED IN THE PROSPECTIVE PAYMENT SYSTEM FOR FY 1990

	Number of hospitals ¹	Recalibration change ²	Wage index change ³	All changes ⁴
		(1)	(2)	(3)
All Hospitals	5,557	-1.1	-0.1	3.7
Urban by Region	2,984	-1.0	-0.1	3.7
New England	182	-1.1	0.6	3.8
Middle Atlantic	381	-0.9	0.0	3.3
South Atlantic	444	-1.1	0.0	3.8
East North Central	540	-1.1	-0.7	3.1
East South Central	179	-1.0	-0.1	3.6
West North Central	200	-0.9	0.1	4.2
West South Central	374	-1.1	0.4	4.3

TABLE I—IMPACT OF THE CHANGES BEING IMPLEMENTED IN THE PROSPECTIVE PAYMENT SYSTEM FOR FY 1990—Continued

	Number of hospitals ¹	Recalibration change ²	Wage index change ³	All changes ⁴
		(1)	(2)	(3)
Mountain.....	119	-1.0	-0.1	4.0
Pacific.....	515	-1.0	0.0	4.1
Puerto Rico.....	50	-1.5	-0.1	3.5
Rural by Region.....	2,573	-1.7	-0.1	3.5
New England.....	61	-1.5	0.4	4.0
Mid Atlantic.....	91	-1.5	-0.5	2.4
South Atlantic.....	343	-1.7	0.4	4.3
East North Central.....	332	-1.7	-0.1	3.67
East South Central.....	309	-1.8	0.2	3.3
West North Central.....	578	-2.0	-0.3	3.2
West South Central.....	343	-1.9	-0.6	3.5
Mountain.....	251	-1.8	0.0	3.9
Pacific.....	166	-1.6	-0.6	3.1
Puerto Rico.....	8	-2.1	-0.2	3.0
Large Urban Areas (populations over 1 million).....	1,408	-1.0	-0.2	3.6
Other Urban Areas (populations with 1 million or fewer).....	1,504	-1.1	0.1	3.9
Urban Hospitals.....	2,984	-1.0	-0.1	3.7
0 to 99 Beds.....	696	-1.7	-0.1	3.3
100 to 199 Beds.....	779	-1.4	-0.1	3.5
200 to 299 Beds.....	580	-1.2	-0.1	3.6
300 to 499 Beds.....	611	-1.0	0.0	3.8
400 plus Beds.....	271	-0.7	-0.1	3.8
Rural Hospitals.....	2,573	-1.7	-0.1	3.5
0 to 49 Beds.....	1,061	-2.2	-0.1	3.0
50 to 99 Beds.....	832	-1.9	-0.2	3.1
100 to 149 Beds.....	367	-1.8	-0.1	3.6
150 to 200 Beds.....	150	-1.7	-0.2	3.2
200 plus Beds.....	149	-1.4	-0.0	4.2
Teaching Status:				
Nonteaching.....	4,417	-1.5	-0.1	3.6
Resident/Bed Ratio Less Than 0.25.....	920	-1.0	-0.1	3.7
Resident/Bed Ratio 0.25 or Greater.....	218	-0.5	0.0	3.9
Disproportionate Share Hospitals (DSH):				
Non DSH.....	4,070	-1.3	-0.1	3.7
Urban DSH 100 Beds or More.....	1,069	-0.9	-0.1	3.7
Urban DSH Fewer Than 100 Beds.....	131	-1.4	-0.1	3.2
Rural DSH.....	287	-1.8	-0.3	2.8
Urban Teaching and DSH:				
Both Teaching and DSH.....	578	-0.7	-0.1	3.7
Teaching Only.....	478	-0.9	-0.1	3.8
DSH Only.....	622	-1.3	-0.1	3.6
Nonteaching and Non-DSH.....	1,306	-1.4	0.0	3.6
Other Special Status (Rural):				
Sole Community Hospital (SCHs).....	308	-1.9	-0.1	3.4
Rural Referral Center (RRCs).....	195	-1.5	0.1	5.2
Both SCH & RRC.....	23	-1.4	0.0	4.0
Type of Ownership:				
Voluntary.....	3,021	-1.1	-0.1	3.6
Proprietary.....	915	-1.3	0.1	3.8
Government.....	1,552	-1.2	0.0	3.7
Medicare Utilization as a Percent of Inpatient Days:				
0 to 25.....	396	-0.8	-0.1	3.7
25 to 50.....	2,923	-1.1	0.0	3.8
50 to 65.....	1,705	-1.3	-0.1	3.5
Over 65.....	403	-1.4	-0.3	3.5

¹ Because data necessary to classify some hospitals by category were missing, some hospitals were omitted from the analysis. Therefore, the total number of hospitals in each category may not equal the national total. Also, we have excluded Indian Health Service hospitals from our analysis because they are paid under special payment policies not applicable to any other hospitals under the prospective payment system.

² Recalibration of the DRG weights and classification changes are based on FY 1988 MEDPAR data and are performed annually in accordance with section 1886(d)(4)(C) of the Act. This column reflects the -1.22 percent adjustment in the DRG weights for the increase in the case-mix index attributable to DRG reclassification and recalibration. The -1.22 adjustment has a uniform impact on all hospitals.

³ The wage index constructed entirely from 1984 hourly wage data was compared to the current wage index which is based on a blend of 1982 and 1984 data. The wage index also reflects changes required by section 1886(d)(8)(C) of the Act (which was added by section 8403(a) of Pub. L. 100-647). This provision requires the Secretary to compute a separate wage index value for an urban or rural area if the wage index value for that area was reduced as a result of deeming the hospitals in certain rural counties as urban in accordance with section 1886(d)(8)(B) of the Act.

⁴ This column shows the combined effects of all the previous columns as well as the effects of updating the FY 1989 standardized payment amounts by the market basket increase as mandated by section 1886(b)(3)(B)(i) of the Act. Also, FY 1989 baseline payments reflect an estimate of outlier payments at 5.7 percent in contrast to the 5.1 percent set for the outlier pool. This estimate of payments from the outlier pool is exclusive of the approximately 1.0 percent additional outlier payments that result from the elimination of the day limitation on inpatient hospital services under Pub. L. 100-360. Because our total FY 1990 estimated payments do not perpetuate this 0.6 percent excess of outlier payments relative to the outlier pool, this column reflects the 0.6 percent reduction in total prospective payments necessary to ensure equality between projected outlier payments and the outlier offsets. In addition, this column captures certain interactive effects that we are not able to quantify.

B. Changes to the DRG Classification System and Recalibration of the DRG Weights, and Changes to the Wage Index

In Column 1, we present the combined effects of revising the current DRG definitions and recalibrating the weights to reflect changes in practice patterns, modes of treatment, and new technologies as required each year by section 1886(d)(4)(c) of the Act. These changes are described in section II.C. of the preamble to this rule. (The DRGs that have been recalibrated for this analysis also reflect, insofar as possible, the changes to the DRG classification system set forth in section II.B. of the preamble of this final rule.) As part of recalibrating and normalizing the DRG weights, we are adjusting all the DRG weights to correct for increases in the average case-mix index that have resulted from past GROUPER modifications. As explained in detail in section II.C. of the preamble to this final rule, we are reducing each DRG weight by 1.22 percent over what it would have been without this adjustment. Thus, in the following analysis, we compared estimated FY 1989 hospital payments using an estimate of each hospital's case-mix index based on the current DRG classifications and weighting factors to FY 1989 simulated payments using an estimate of each hospital's case-mix index based on the new DRG classifications and recalibrated weighting factors.

Nationally, revision to the DRG weights being implemented for FY 1990, with all other variables held constant, produce a 1.1 percent decrease in payments per case. However, within certain census divisions and among certain types of hospitals, DRG reclassification and recalibration appears to have a differential impact on hospital payments as a result of shifts in the relative weights among DRGs. In analyzing these shifts, we found that the DRGs with increased relative weights tended to be more expensive initially (higher weighted) than the DRGs with decreased relative weights. Since rural hospitals have a lower case mix, one result is that the average case weight for rural hospitals will decrease relative to the average case weights for urban hospitals. Consequently, reclassifying and recalibrating DRGs will have a disproportionate impact on rural hospitals. The average reduction in payments to rural hospitals will be about 1.7 percent compared to an average reduction of about 1.0 percent for urban hospitals when we hold other payment variables constant. Holding all other payments variables constant, rural

hospitals with fewer than 50 beds will experience a reduction in payments of 2.2 percent. Holding all other payment variables constant, sole community hospitals and other rural hospitals would experience payment reductions of about 1.4 percent.

The fact that DRG reclassification and recalibration has the greatest impact on small rural hospitals and sole community hospitals may explain the larger than average reductions for rural hospitals in the West North Central and West South Central census divisions. The majority of small hospitals and sole community hospitals are located in these areas.

Column 2 of Table II displays the estimated effects of changes to the wage index in this rule. As discussed in section III of the preamble, we are basing the wage index required under section 1886(d)(3)(E) and 1886(c)(9)(B)(vi) of the Act entirely on 1984 gross hourly wage data rather than on an equal blend of an index based on 1982 data and one based on 1984 data (as described in section III.B. of the preamble to this final rule). The wage index values also reflect changes required by section 1886(d)(8)(C) of the Act (which was added by section 8403(a) of the Technical and Miscellaneous Revenue Act of 1988 (Pub. L. 100-647)). This provision requires the Secretary to compute a separate wage index value for an urban or rural area if the wage index value for that area was reduced as a result of deeming hospitals in certain rural counties as urban in accordance with section 1886(d)(8)(B) of the Act (see section III.C. of the preamble to this final rule).

The changes to the wage index will have no significant effect on overall payments. The effect on hospitals in different geographic areas varies from an average 0.6 increase in payments for hospitals in the urban areas of the New England census division to a 0.7 reduction in payments for hospitals located in the urban localities of the East North Central census division. Generally, the new wage index changes will have the same effect on the overall distribution of payments to other urban and rural hospitals. The changes to the wage index will have slight effect on rural hospitals with fewer than 50 beds equal to the effect on all hospitals.

C. Combined Effects

Column 3 of Table I shows the FY 1990 rates that incorporate the combined effects of all the changes we are able to quantify. In addition to the changes described in columns 1 and 2, column 3

reflects the update factors mandated under section 1886(b)(3)(B)(i) of the Act.

Because Column 3 combines the FY 1990 payment rates and all other changes, the effects displayed also include the payment offset for outlier payments required under section 1886(d)(5)(A)(iv) of the Act. This provision requires that total outlier payments should not be less than five percent nor more than six percent of total prospective payments. In our analysis, similar to the analysis for FY 1989, we have set outlier thresholds and offset urban and rural rates for outliers so as to yield estimated outlier payments for FY 1990 equal to 5.1 percent of total DRG payments. In addition, sections 1886(d)(3)(B) and (d)(9)(b)(iv) of the Act requires that the urban and rural rates be offset by the same percentage of total payments that are outlier payments for urban and rural hospitals, respectively. Based on the most recent discharge data available, however, we anticipate that total outlier payments for FY 1989 (exclusive of the impact of the Medicare Catastrophic Coverage Act of 1988 (Pub. L. 100-360)) will equal 5.7 percent of total prospective payments, instead of the 5.1 percent accounted for by the offsets to the current rates. Therefore, column 3 also reflects a reduction of 0.6 percent in payments compared to FY 1989 payments because the FY 1989 baseline payments are overstated by the 0.6 percent outlier payments in excess of the outlier offsets reflected in the FY 1989 standardized amounts. The 5.7 percent estimate of payments from the outlier pool is exclusive of the additional outlier payments that result from the elimination of the limitation on inpatient hospital services under section 101 of Pub. L. 100-360. Outlier payments resulting from the provisions of Pub. L. 100-360 are estimated at 1.0 percent of total DRG payments, resulting in an estimated 6.7 percent in total FY 1989 outlier payments. We estimate that the additional outlier payments resulting from the changes made by Pub. L. 100-360 will be 1.3 percent in FY 1990 and will result in FY 1990 outlier payments equal to 6.4 percent of total DRG payments.

Nationally, the effects of all changes we are making are expected to result in a 3.7 percent payment increase. Geographically, hospitals in rural areas of the South Atlantic census division and urban localities in the West South Central census division will receive the largest percentage increase in prospective payments of 4.3 percent. However, hospitals in rural areas of the Pacific census division and urban

hospitals in the East North Central census division could expect only a 3.1 percent increase over FY 1989 payments.

Generally, urban hospitals will receive a payment increase averaging 3.7 percent (the national average) while the average increase for all rural hospitals would be 3.5 percent. Among rural hospitals, it appears that hospitals with over 200 beds would receive an increase in payments of 4.2 percent while hospitals with fewer than 50 beds would receive an increase of about 3.0 percent.

Among the different types of hospitals, rural referral centers will receive the largest increase in payments (5.2 percent) while disproportionate share hospitals located in rural areas will receive the smallest payment increase (2.8 percent). Sole community

hospitals will receive an increase of about 3.4 percent. Type of ownership does not appear to be a factor influencing payment increases.

Hospitals grouped by type of control (voluntary, proprietary and government) would receive payment increases at or near the national average percentage increase. Hospitals that have high Medicare utilization (hospitals with more than 65 percent Medicare patient days) can expect an average payment increase of about 3.5 percent while hospitals with between 25 and 50 percent Medicare patients days can expect an average payment increase of about 3.8 percent.

We must point out that there are interactions that result from the combining of the various separate provisions analyzed in the previous

columns that we are unable to isolate. Thus, the values appearing in column 3 do not represent merely the additive effects of the previous columns plus the update factors.

Table II presents the projected FY 1990 average payments per case for urban and rural hospitals and for the different categories of hospitals shown in Table I, and compares them to the average estimated per case payments for FY 1989. As such, this table presents the combined effects of the changes presented in Table I in terms of the average dollar amounts paid per discharge. That is, the percentage change in average payments from FY 1989 to FY 1990 equals the percentage changes shown in the last column of Table I.

TABLE II.—COMPARISON OF PAYMENT PER CASE
[FY 1990 Compared to FY 1989]

	Number of hospitals	Average FY 1989 payment per case	Average FY 1990 payment per case	Percentage Change ¹
		(1)	(2)	(3)
All Hospitals.....	5,557	4,598	4,767	3.7
Urban by Region.....	2,984	5,065	5,252,431	3.7
New England.....	182	5,065	5,231	3.8
Middle Atlantic.....	381	5,645	5,832	3.3
South Atlantic.....	444	4,632	4,807	3.8
East North Central.....	540	5,007	5,162	3.1
East South Central.....	179	4,306	4,469	3.8
West North Central.....	200	5,103	5,316	4.2
West South Central.....	374	4,640	4,839	4.3
Mountain.....	119	5,006	5,204	4.0
Pacific.....	515	5,789	6,026	4.1
Puerto Rico.....	50	2,039	2,111	3.5
Rural by Region.....	2,573	2,956	3,060	3.5
New England.....	61	3,568	3,712	4.0
Middle Atlantic.....	91	3,362	3,444	2.4
South Atlantic.....	343	2,999	3,128	4.3
East North Central.....	332	3,024	3,132	3.6
East South Central.....	309	2,605	2,690	3.3
West North Central.....	578	2,811	2,900	3.2
West South Central.....	434	2,727	2,822	3.5
Mountain.....	251	3,102	3,221	3.9
Pacific.....	166	3,667	3,780	3.1
Puerto Rico.....	8	1,543	1,589	3.0
Large Urban Areas (population over 1 million).....	1,480	5,518	5,714	3.6
Other Urban Areas (populations with 1 million or fewer).....	1,504	4,593	4,772	3.9
Urban Hospitals.....	2,984	5,065	5,252	3.7
0-99 Beds.....	696	3,864	3,992	3.3
100-199 Beds.....	779	4,318	4,467	3.5
200-299 Beds.....	580	4,716	4,888	3.6
300-499 Beds.....	611	5,143	5,337	3.8
400 + Beds.....	271	6,082	6,315	3.8
Rural Hospitals.....	2,573	2,956	3,060	3.5
0-49 Beds.....	1,061	2,510	2,585	3.0
50-99 Beds.....	832	2,684	2,768	3.1
100-149 Beds.....	367	2,902	3,008	3.6
150-200 Beds.....	150	3,161	3,263	3.2
200 + Beds.....	149	3,503	3,650	4.2
Teaching Status.....				
Nonteaching.....	4,417	3,836	3,973	3.6
Resident/Bed Ratio Less than 0.25.....	920	5,089	5,277	3.7
Resident Bed Ratio 0.25 or Greater.....	218	7,907	7,907	3.9
Disproportionate Share Hospitals (DSH).....				
Non-DSH.....	4,070	4,169	4,322	3.7
Urban DSH 100 Beds or More.....	1,069	5,586	5,792	3.7
Urban DSH Fewer than 100 Beds.....	131	4,229	4,366	3.2
Rural DSH.....	287	2,833	2,913	2.8

TABLE II.—COMPARISON OF PAYMENT PER CASE—Continued

(FY 1990 Compared to FY 1989)

	Number of hospitals	Average FY 1989 payment per case	Average FY 1990 payment per case	Percentage Change ¹
		(1)	(2)	(3)
Urban Teaching and DSH				
Both teaching and DSH	578	6,163	6,393	3.7
Teaching Only	478	5,266	5,466	3.8
DSH Only	622	4,538	4,700	3.6
Non-teaching and Non-DSH	1,306	4,264	4,418	3.6
Other Special Status (Rural)				
Sole Community Hospital (SCHs)	308	2,948	3,049	3.4
Rural Referral Center (RRCs)	195	3,570	3,756	5.2
Both SCH & RRC	23	3,616	3,761	4.0
Type of Ownership				
Voluntary	3,021	4,773	4,946	3.6
Proprietary	915	4,106	4,264	3.8
Government	1,552	4,176	4,331	3.7
Medicare Utilization as a Percent of Inpatient Days				
0-25	396	6,086	6,310	3.7
25-30	2,923	4,803	4,983	3.8
50-65	1,705	4,060	4,201	3.5
Over 65	403	3,865	3,999	3.5

¹ Percentage changes shown in this column are taken from Table 1, column 3. Because the dollar amounts shown in this table are rounded to the nearest dollar, percentage changes computed on the basis of these amounts will differ slightly from those displayed in this column.

Appendix B—Final Recommendation of Update Factors for Rates of Payment for Inpatient Hospital Services

Section 1886(e)(4) of the Act, as amended by section 4002(f) of Pub. L. 100-203, requires that the Secretary, taking into consideration the recommendations of ProPAC, recommend update factors for FY 1990 that take into account the amounts necessary for the efficient and effective delivery of medically appropriate and necessary care of high quality. Section 1886(e)(4) of the Act also applies to the target rate-of-increase limits for hospitals excluded from the prospective payment system.

As required by section 1886(e)(5) of the Act, we published the initial recommended FY 1990 update factors that are provided for under section 1886(e)(4) of the Act as Appendix C of the proposed rule (54 FR 19747). We recommended that the prospective payment rates be increased, on average, by an amount equal to the market basket percentage increase minus 1.5 percentage points. Based on the forecasted hospital market basket increase at the time the proposed rule was published, that is, 5.8 percent, the recommended update was 4.3 percent on average.

However, in making that recommendation, we stated that differential updates for hospitals in rural, large urban, and other urban areas would be more appropriate than a uniform update to the payment amounts. Therefore, we strongly recommended a higher update for hospitals located in

rural areas. We also recommended that hospitals located in large urban areas receive a higher update than hospitals located in other urban areas. In addition, we recommended a higher update to the target rate-of-increase limits for hospitals excluded from the prospective payment system than the average update of the market basket increase minus 1.5 percentage points.

In recommending these increases, we took into account the requirement in section 1886(e)(4) of the Act that the amounts be high enough to ensure the efficient and effective delivery of medically appropriate and necessary care of high quality. In addition, as required by section 1886(e)(4) of the Act, we addressed ProPAC's Recommendations 1 through 7, which concern updating the standardized amounts and the rate-of-increase limits. Also, we requested public comment on our recommendation.

We note that although we recommended appropriate update factors, requested and received public comments on these recommendations, and are providing a final recommendation, Congress actually prescribed the update factors to be used in FY 1990 in section 1886(b)(3)(B)(i) of the Act, as amended by section 4002(a) of the Omnibus Budget Reconciliation Act of 1987 (Pub. L. 100-203). That is, as explained in the addendum to this final rule, the applicable percentage increase for FY 1990 for inpatient hospital services for hospitals subject to the prospective payment system is equal to the market basket rate of increase

forecasted for FY 1990. The most recent forecasted hospital market basket increase for FY 1990 is 5.5 percent. Therefore, the applicable percentage increase for prospective payment hospitals is 5.5 percent.

For cost reporting periods beginning on or after October 1, 1989, and before October 1, 1990, section 1886(b)(3)(B)(ii) of the Act, as amended by section 4002(e) of Pub. L. 100-203, provides that the applicable percentage increase for hospitals and hospital units excluded from the prospective payment system equals the hospital market basket rate of increase. As noted above, the most recent forecasted market basket increase is 5.5 percent; therefore the increase in these hospitals and hospital units target rate is also 5.5 percent.

We received several items of correspondence during the public comment period concerning our initial recommendation. After consideration of all the arguments presented, we have decided that our final recommendation will be the same as our initial recommendation. That is, we recommend that, on average, all hospitals receive an update in their payments for FY 1990 equal to the market basket percentage increase minus 1.5 percentage points. Based on the most recent forecasted hospital market basket increase of 5.5 percent, our recommended update is 4.0 percent on average.

To date, our analyses indicate that, while hospitals nationally continued to have positive Medicare operating margins on average in the fourth year of

the prospective payment system, these levels have fallen from the high operating margins experienced in the first 2 years of that system. For this reason, we believe a prospective payment system update somewhat higher than the updates in past years is generally appropriate in order to ensure the availability of high quality care to Medicare beneficiaries. However, we believe that an average update factor lower than the market basket rate of increase is needed to continue to encourage hospitals to better control their costs.

Although we are recommending an update that averages the market basket percentage increase minus 1.5 percentage points for all prospective payment system hospitals, we recommend differentiation of the update according to the geographic classification of the hospital. We strongly recommend a higher update for hospitals located in rural areas. We also recommend that hospitals located in large urban areas (that is, those with a population exceeding 1,000,000) receive a higher update than hospitals located in other urban areas.

We are recommending differential updates based on geographic classification of hospitals as a result of our research on hospitals Medicare operating margins and our analysis of the impact the FY 1990 rates (based on a uniform update) will have on hospitals. While overall margins in FY 1987, the latest period for which we have complete data, were 5.3 percent, we found a disparity between urban and rural margins. Urban hospitals had FY 1987 inpatient Medicare operating margins of 6.3 percent. Rural hospital operating margins were -0.2 percent. Further, rural hospitals under 50 beds, which constitute 40 percent of rural hospitals, experienced, on average, operating margins of -2.9 percent. Because of our concerns with respect to the financial viability of rural hospitals, we believe that a higher update is appropriate. For hospitals in large urban areas, our data suggest that inpatient operating margins are declining as compared to the operating margins of hospitals in other urban areas, although such margins remain positive. For FY 1987, our data indicate that hospitals in large urban areas experienced margins of 5.8 percent as compared to 6.8 percent for hospitals in other urban areas. In view of the differences between costs per case and payments per case and the lower average Medicare operating margins in large urban areas, we believe that hospitals in large urban areas

should receive a higher update than hospitals in other urban areas.

The FY 1990 rates are based on a uniform update equal to the percentage increase in the market basket, currently estimated at 5.5 percent. However, because of changes to the DRG weights and the wage index, as well as a reduction in outlier payments over current estimated FY 1989 levels, the FY 1990 rates will have a differential impact on hospitals according to geographic location. The net effect of all changes would be to increase payments to rural hospitals by 3.5 percent, to large urban hospitals by 3.6 percent, and to other urban hospitals by 3.9 percent. The net effect of all changes in this final rule, including the current law update, is a differential impact that is the opposite of the impact that would be appropriate based on the analysis of Medicare operating margins. Implementation of a higher update for rural hospitals and for large urban hospitals would reverse this effect.

Comment: Some commenters expressed concern that the update factor recommended by the Secretary did not include a discussion or presentation of the data used to form the basis of our recommendation and that the Secretary's recommendation was driven purely by budgetary requirements.

Response: While we have recommended an update to the prospective payment rates that is consistent with the Administration's budget proposal, our recommendation has analytic support. As in the past, we view the factors to be considered by the Secretary as a combination of hospital inputs, outputs, and outcomes.

The technical factors associated with the input and output portions of the update that we have considered include such items as the input costs faced by hospitals (that is, the hospital market basket), hospital productivity, advances in science and technology, and changes in the nature of the practice patterns in hospitals. The productivity measure represents a future-oriented standard that incorporates expected savings based on established productivity goals. At the beginning of the prospective payment system update process, HCFA established a conservative standard for hospital productivity increase of 1.0 percent per year and, therefore, used a -1.0 percent adjustment for productivity increases. In the short run, any increases in productivity in excess of 1.0 percent would be kept by hospitals as increases in the operating margin. Increases in productivity of less than 1.0 percent would be discouraged

by this standard as it affects hospital payment rates. Hospitals have made substantial increases in productivity since the implementation of the prospective payment system, and we believe that productivity gains can and should continue.

With respect to technological advances, we have relied on the results of several studies. ProPAC's study on the operating costs of new science and technology indicated that most new technologies are substitutes for old technologies and in many cases are less expensive. Other studies have shown the cost of the top 100 technologies to be relatively small in the absolute. While it appears that new devices and diagnostic procedures tend to have only a small impact on overall hospital costs, we believe it is appropriate to encourage hospitals to use health-enhancing new technologies and that a small adjustment for new technologies is appropriate.

We continue to measure for practice pattern changes based on changes in average length of stay since the beginning of the prospective payment system. We note that this represents a crude measure that does not capture all changes in practice patterns that have occurred. Average length of stay declined dramatically during the first years of the prospective payment system, but has gradually increased in the last few years. However, we believe an adjustment of as much as -0.84 percent for cumulative changes in practice patterns would be appropriate.

We have not developed an adjustment for case-mix changes as part of our recommended update because of the inherent difficulties in measuring real case-mix changes versus coding improvements. While average case mix continues to increase, we recognize that much of the upcoding noted in earlier years has leveled off. However, we agree with ProPAC's assessment that not all of the case-mix increase is attributable to increases in case complexity and that some coding improvements continue to be reflected in the observed case-mix increase.

Of the various factors that are considered in the update recommendation, outcomes are particularly difficult to analyze. For this reason, HCFA has recommended close monitoring of indicators such as the level of preventable deaths, premature discharge, and substandard regimens of care. The Secretary and the Congress have had to make subjective judgment on how these factors affect the final update amount.

Taking all these factors into account, we believe our recommended average update amount for FY 1990 of market basket percentage increase minus 1.5 percent is appropriate and that an average update factor lower than the market basket rate of increase is needed to continue to encourage hospitals to better control their costs.

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**Friday
September 1, 1989**

Part III

Environmental Protection Agency

40 CFR Part 261

Mining Waste Exclusion; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[SWH-FRL-3625-8; EPA/OSW-FR-89-017]

RIN 2050 AC41

Mining Waste Exclusion

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: Section 3001(b)(3)(A)(ii) of the Resource Conservation and Recovery Act (RCRA) excludes "solid waste from the extraction, beneficiation, and processing of ores and minerals" from regulation as hazardous waste under subtitle C of RCRA, pending completion of certain studies by EPA. In 1980, EPA interpreted this exclusion (on a temporary basis) to encompass "solid waste from the exploration, mining, milling, smelting, and refining of ores and minerals" (45 FR 76619, November 19, 1980).

Today's final rule responds to a federal Appeals Court directive to narrow this exclusion as it applies to mineral processing wastes. EPA published a proposed rule articulating the criteria by which mineral processing wastes would be evaluated for continued exclusion on October 20, 1988 (53 FR 41288) and a revised proposal on April 17, 1989 (54 FR 15316). In today's final rule, EPA provides final criteria that have been modified in response to public comment, and finalizes the Bevill status of nine mineral processing waste streams that were proposed for either retention within or removal from the exclusion in the April notice. In addition, the Agency has modified the list of mineral processing wastes proposed for conditional retention in April, based upon the revised criteria and information submitted in public comment. All other mineral processing wastes that have not been listed for conditional retention will be permanently removed from the Bevill exclusion as of the effective date of this rule.

The Agency will apply the criteria described in this rule to the conditionally retained wastes and on that basis propose either to remove them from or retain them in the Bevill exclusion by September 15, 1989. Final Agency action on the scope of the Bevill exclusion for mineral processing wastes will occur by January 15, 1990.

DATES: Effective Date: March 1, 1990.

Not later than November 30, 1989, all persons who generate, transport, treat, store, or dispose of wastes removed from temporary exclusion by this rule and which are characteristically hazardous under 40 CFR part 261, subpart C, will be required to notify either EPA or an authorized State of these activities pursuant to section 3010 of RCRA.

See sections VI and VII of the preamble below for additional dates and details.

FOR FURTHER INFORMATION CONTACT: RCRA/Superfund Hotline at (800) 424-9346 or (202) 382-3000 or for technical information contact Dan Derkics, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, (202) 382-3608.

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I. Introduction

A. History

Section 3001(b)(3)(A)(ii) of the Resource Conservation and Recovery

Act (RCRA) excludes "solid waste from the extraction, beneficiation and processing of ores and minerals" from regulation as hazardous waste under subtitle C of RCRA, pending completion of certain studies by EPA. In 1980, the Agency interpreted this exclusion (on a temporary basis) to encompass all "solid waste from the exploration, mining, milling, smelting, and refining of ores and minerals" (45 FR 76619, November 19, 1980). In July, 1988, a federal Court of Appeals (*Environmental Defense Fund v. EPA*, 852 F.2d 1316 (D.C. Cir. 1988), cert. denied, 109 S. Ct. 1120 (1989) ("EDF II")) found that this exclusion is based upon the "special waste" concept first proposed by EPA in 1978 (43 FR 58946) and that

Congress intended the term "processing" in the Bevill Amendment to include only those wastes from processing ores or minerals that meet the "special waste" concept, that is "high volume, low hazard" wastes. 852 F.2d at 1326-29.

In compliance with this Court decision, on October 20, 1988 EPA published a proposal to further define the scope of section 3001(b)(3)(A)(ii) of RCRA. (See 53 FR 41288) In the October 20, 1988 proposal, EPA presented a criterion for defining mineral processing wastes and a two-part criterion for identifying which mineral processing wastes are high volume; however, the Agency proposed to defer judgment on the hazard posed by high volume mineral processing wastes until preparation of a required Report to Congress. The Agency also applied the processing and volume criteria to its available data on mineral processing wastes, and identified 15 wastes which it believed met the criteria, and which the Agency therefore proposed to retain within the exclusion and study for the report to Congress:

1. Slag from primary copper smelting
2. Process wastewater from primary copper smelting/refining
3. Blowdown from acid plants at primary copper smelters
4. Bleed electrolyte from primary copper refining
5. Slag from primary lead smelting
6. Blowdown from acid plants at primary zinc smelters
7. Process wastewater from primary zinc smelting/refining
8. Red and brown muds from bauxite refining
9. Phosphogypsum from phosphoric acid production
10. Slag from elemental phosphorus production
11. Iron blast furnace slag
12. Air pollution control dust/sludge from iron blast furnaces

13. Waste acids from titanium dioxide production
14. Air pollution control dust from lime kilns
15. Slag from roasting/leaching of chromite ore

Based on comments received on the October 20, 1988 NPRM and further analysis, EPA decided that significant changes in the proposal were necessary before a final rule establishing the boundaries of the Bevill exclusion for mineral processing wastes could be promulgated. Accordingly, on April 17, 1989, the Agency published a revised proposed rule that contained a modified high volume criterion, clarifications to the definition of mineral processing, and for the first time, an explicit low hazard criterion. As stated in the April notice, EPA believes that such a criterion is required in order to identify those mineral processing wastes that are clearly not low hazard and, therefore, not "special wastes" even if they are high volume.

In the April NPRM, the Agency also proposed to remove from the Bevill exclusion all but 39 mineral processing wastes, many of which were "nominated" in public comment on the October NPRM. Of these 39, six wastes were believed at that time to satisfy all of the "special waste" criteria described in the proposal:

1. Slag from primary copper smelting
2. Slag from primary lead smelting
3. Red and brown muds from bauxite refining
4. Phosphogypsum from phosphoric acid production
5. Slag from elemental phosphorus production
6. Furnace scrubber blowdown from elemental phosphorus production

The other 33 wastes were proposed to be conditionally retained within the exclusion, because they are mineral processing wastes that the Agency believed satisfied the volume criterion articulated in the proposal but for which the Agency did not have adequate data to evaluate compliance with the proposal's new hazard criterion. Thus, the following 33 wastes were judged, based in many cases upon information submitted in public comment, to have generation rates that might exceed 50,000 metric tons per year per facility, and therefore, be potentially eligible for continued exclusion under Bevill:

1. Barren filtrate from primary beryllium processing
2. Raffinate from primary beryllium processing
3. Bertrandite thickener sludge from primary beryllium processing

4. Process wastewater from primary cerium processing
5. Ammonium nitrate process solution from primary lanthanide processing
6. Roast/leach ore residue from primary chrome ore processing
7. Gasifier ash from coal gasification
8. Cooling tower blowdown from coal gasification
9. Process wastewater from coal gasification
10. Bleed electrolyte from primary copper refining
11. Process wastewater from primary copper smelting/refining
12. Slag tailings from primary copper smelting
13. Calcium sulfate wastewater treatment plant sludge from primary copper smelting/refining
14. Furnace off-gas solids from elemental phosphorus production
15. Process wastewater from elemental phosphorus production
16. Fluorogypsum from hydrofluoric acid production
17. Air pollution control dust/sludge from iron blast furnaces
18. Iron blast furnace slag
19. Process wastewater from primary lead smelting/refining
20. Air pollution control scrubber wastewater from light weight aggregate production
21. Wastewater treatment sludge/solids from light weight aggregate production
22. Process wastewater from primary magnesium processing by the anhydrous process
23. Process wastewater from primary selenium processing
24. Process wastewater from phosphoric acid production
25. Wastes from trona ore processing
26. Basic oxygen furnace slag from carbon steel production
27. Leach liquor from primary titanium processing
28. Sulfate processing waste acids from titanium dioxide production
29. Sulfate processing waste solids from titanium dioxide production
30. Chloride processing waste acids from titanium and titanium dioxide production
31. Chloride processing waste solids from titanium and titanium dioxide production
32. Blowdown from acid plants at primary zinc smelters
33. Process wastewater from primary zinc smelting/refining

All other waste streams from mineral processing were proposed to be removed from the exclusion. Most of the remaining streams would be low volume; three high volume wastes were proposed for removal on the basis of

hazard: Acid plant/scrubber blowdown from the primary copper, lead, and tin sectors.

Finally, the April notice responded to a number of ancillary issues raised in public comment on the October 20, 1988 NPRM. The preamble to the notice presented a summary of these comments and preliminary Agency responses to the questions and issues raised therein. Responses to additional comments received on issues addressed in the April NPRM may be found in section II below or in the Supplemental Response to Comments, which may be found in the docket supporting today's rule.

A complete chronology of the special wastes concept, the Bevill Amendment, and EPA's activities to implement the Bevill Amendment is also presented in the "background" section of the preamble to the April NPRM (53 FR 15318-22).

B. Overview of Today's Rule

Today's rule establishes the final criteria that will be used to define Bevill-excluded mineral processing wastes. This final rule completes the first stage of rulemaking regarding the Bevill status of mineral processing wastes. In evaluating the components of this rule, the Agency has considered information presented in public comment on the October 1988 and April 1989 proposals, and accordingly, has modified the criteria, where appropriate.

These criteria consist of a revised and clarified definition of mineral processing, a modified volume criterion that consists of separate volume cut-offs for solid/sludge and liquid waste streams, and a refined low hazard criterion. Each will be discussed briefly in turn. More detailed descriptions are presented in section III of this preamble.

The definition of mineral processing has been modified so as to include fewer types of unit operations. In most instances, operations that are no longer considered "processing" have been redesignated "beneficiation" operations. The primary reason for making this change is to achieve consistency with previously articulated EPA definitions of "beneficiation". Today's definition provides resolution of potential conflicts regarding the regulatory status of mining wastes that have already been studied and subjected to a Regulatory Determination; the definitions provided in the proposed rules might have suggested another study and determination for materials that have already been addressed by the Agency. EPA did not intend such a result and believes that the definition of "beneficiation" in its 1985 Report to

Congress is the most consistent with the standard use of the term.

The high volume criterion has been bifurcated in response to public comment on the April notice. EPA has determined empirically that amenability to subtitle C management controls (the basis for the high volume criterion) varies markedly between liquid and non-liquid waste streams. Examination of data obtained from a recent EPA nationwide census of subtitle C treatment, storage, disposal and recycling facilities reveals that many industrial facilities successfully manage substantially more than 50,000 metric tons per year of a single hazardous wastewater stream. Non-liquid waste streams, in contrast, are managed in quantities greater than 50,000 metric tons per year in only a few instances. Accordingly, the Agency has in today's rule established final volumetric cut-offs of 45,000 metric tons per year per facility for non-liquid wastes and 1,000,000 metric tons per year per facility for liquid wastes. The rationale for these new values is presented in section III, below.

The low hazard criterion described in the April NPRM has been modified to account for resolution of a number of issues raised in public comment. While the Agency has retained its basic approach, it has modified the application of the low hazard criterion to specific waste streams in order to account for additional waste constituent data that have been submitted by facility operators or collected from other sources. The final low hazard criterion is applied by evaluating the data collected by EPA and analyzed using Method 1312 (Synthetic Precipitation Leaching Procedure). If samples of a waste stream from two or more facilities fail the test, then the waste is withdrawn from the Bevill exclusion, unless a preponderance of evidence indicates that the test results are anomalous. The conditions under which EPA will assemble and consider this evidence are discussed in section III of this preamble.

As stated in both the October 1988 and April 1989 proposals, individual waste streams must meet all Bevill special mineral processing waste criteria to be eligible for continued regulatory exclusion and study in the Report to Congress. In many cases, individual mineral processing wastes will not meet these criteria and hence, will be permanently removed from the Bevill exclusion as of the effective date of this rule.

In a limited number of cases, EPA does not currently have sufficient information to evaluate whether specific

waste streams conform to the low hazard criterion. As discussed below, the status of these materials will be addressed in a subsequent rulemaking. At that time, the Agency will also reevaluate whether these wastes conform to the final volume criterion using data collected during EPA's recent National Survey of Solid Wastes from Mineral Processing Facilities.

C. Future Activities

This rule establishes the final criteria that will be employed to make individual Bevill mineral processing waste exclusion decisions. Preliminary decisions on the status of conditionally excluded high volume wastes will be articulated in a proposed rule to be signed on or before September 15, 1989. These decisions will be based upon information collected by or submitted to the Agency during recent months.

Final action on proposed wastes will be taken by January 15, 1990. At this time, the final boundaries of the Mining Waste Exclusion for mineral processing wastes will be established.

All mineral processing wastes retained within the final Bevill mineral processing waste exclusion will be subjected to detailed study by EPA. The findings of these studies will be contained in a Report to Congress that will be submitted by July 31, 1990.

Six months after submission of this report, the Agency will publish a Regulatory Determination stating that the studied materials will either be regulated under subtitle C of RCRA as hazardous wastes, or that such regulation is unwarranted.

II. Analysis of and Response to Public Comments on 10/20/88 and 4/17/89 Proposed Rules

A. EPA's General Approach

1. EPA's Response to Statutory and Judicial Directives

In promulgating today's final rule, EPA is responding to a Federal Court of Appeals order to narrow the scope of the Bevill exclusion for mineral processing wastes to a group of "special wastes," i.e., those mineral processing wastes with the unique characteristics of high volume and low hazard. To carry out these directives, EPA is today finalizing the criterion for defining mineral processing wastes and the criteria for determining whether these wastes fall under the exclusion for "special wastes." Furthermore, EPA is today applying these criteria to many of the mineral processing wastes and, therefore, is removing most of them from the Bevill exclusion. Today's rule also

constitutes final Agency action on a select group of high volume mineral processing wastes. The Bevill status of additional high volume mineral processing wastes (i.e., those that are "conditionally" exempt) will be proposed in September of this year. Some of these conditionally exempt wastes will remain within the exclusion for the purposes of further study, others will be removed because further information shows that they do not meet all of the "special wastes" criteria. Under statutory directive, the final regulatory determination for wastes that remain temporarily excluded will be made six months after completion of a Report to Congress. This is the same basic approach EPA used in its October, 1988 (53 FR 41288) and April, 1989 (54 FR 15316) proposals for narrowing the scope of the Bevill exclusion.

EPA received numerous comments questioning the approach of the October and April proposals in narrowing the Bevill exclusion. Several commenters continued to dispute the validity of using the "special waste" concept in interpreting the intent of the Bevill Amendment. In addition, some commenters asserted that EPA had proposed to interpret the Bevill Amendment too narrowly, and that in general terms wastes from the extraction, beneficiation, and processing of ores and minerals should be excluded from subtitle C regulation until comprehensive studies of these wastes can be completed. In contrast, some other commenters stated that the proposed interpretation of the Bevill exclusion was too broad, and that the exclusion should be limited to even fewer "special wastes."

EPA has carefully considered these comments as they apply to the final rule. The Agency maintains its position that the special waste concept is central to understanding Congressional intent underlying the Bevill Amendment, and that EPA must limit the scope of the Bevill exclusion to include only those wastes that meet the "special waste" criteria presented in the rule. EPA encountered no compelling arguments in public comments on the two proposals which would cause it to alter this interpretation of the legislative history; this history is described in detail in the April NPRM.

EPA's position on this matter is supported and in fact mandated by the 1988 Federal Court of Appeals decision that required a narrowing of the scope of the Bevill exclusion for mineral processing wastes. The Court determined that the Bevill Amendment was intended to apply only to mineral

processing wastes that meet the "special waste" criteria, i.e., high volume, low hazard wastes. The Court ordered EPA to propose and finalize regulations that narrow the Bevill exclusion to encompass only "special wastes;" today's final rule is the latest in a multistep process to meet the requirements of the Court order.

Despite commenter assertions to the contrary, EPA is not required to complete a comprehensive study of all mineral processing waste streams prior to articulating the specific wastes remaining excluded under the Bevill Amendment. The Court of Appeals ruling stipulates that the required study (Report to Congress) is only applicable to mineral processing wastes that fall within the statutory exclusion; the study is intended to result in a final regulatory determination for those wastes (i.e., whether any of the Bevill wastes should be regulated under subtitle C).

EPA notes that there is a lack of detailed statutory, legislative, regulatory, and judicial history and guidance available to assist EPA in defining, ten years after it was originally proposed, the specific contours of the "special waste" concept, particularly as it applies to mineral processing wastes. EPA's 1978 proposal and the 1979 draft background document do not attempt to define the term "processing of ores and minerals" nor attempt to quantify the concepts of "high volume" and "low hazard." The legislative history of the Bevill amendment in 1980 fails to give content to these concepts as well. And while the U.S. Court of Appeals in *EDF II*, declares that six hazardous smelter wastes are not "special wastes," it specifically leaves to EPA the responsibility of defining which other mineral processing wastes are special wastes.

As a result, EPA has the discretion and responsibility to develop and apply criteria that define the scope of the Bevill exclusion within the broad limits of this ten years of history. EPA today adopts the approach proposed in October and April, that is, to quantify the terms "high volume" and "low hazard" and apply them to wastes from operations that meet a definition of "mineral processing" developed by EPA to reflect past regulatory history and EPA's professional judgment regarding the mineral processing industry.

EPA believes that using specific quantitative criteria for the volume and hazard tests best allows EPA to fairly characterize which wastes from mineral processing should remain within the Bevill exclusion. EPA agrees that it could have adopted a functional

approach to defining "special wastes" from mineral processing, or could have set slightly different quantitative cutoffs based on slightly different assumptions regarding both the volume and hazard issues. However, the volume and hazard criteria adopted today are only used as a preliminary screen to define which wastes deserve closer study. And those wastes which do not pass today's criteria are not automatically subjected to subtitle C regulation; they must also exhibit one or more of the hazardous characteristics adopted by EPA in 1980 after extensive consideration and public participation.

EPA does not believe that the specific criteria chosen today are unreasonable, particularly in light of the very limited time given EPA to complete this final rule. Indeed, as EPA shows below, slight changes in the volume and hazard criteria adopted today would not appreciably affect the list of excluded wastes. EPA believes that it has resolved specific issues related to the criteria in a reasonable manner consistent with the general approach for defining "special wastes" outlined above.

2. Status of Future Waste Streams

In both the October 20, 1988 and April 17, 1989 proposals, EPA stated that the current series of rulemakings would conclude the Agency's response to statutory and judicial directives to define the scope of the Bevill exclusion for mineral processing wastes. In other words, EPA proposed to make a one-time determination of Bevill status. Wastes not yet in existence and wastes not meeting the high volume/low hazard criteria during any of the past five years would therefore not be eligible for Bevill exclusion status in the future.

Some commenters addressing this provision reiterated their disagreement with the one-time reinterpretation approach. They maintained that the Bevill Amendment does not place time limits on the exclusion of wastes, thus the one-time reinterpretation violates Congressional intent. They also maintained that a one-time reinterpretation would decrease environmental protection in the long run by creating a disincentive for industry to employ new manufacturing or waste treatment operations that may unfairly fall under costly subtitle C regulation.

Moreover, given the changing nature of the mining industry, some commenters contended that EPA must consider that new processing waste streams will arise, and that lesser volume streams that vary in quantity may satisfy the criterion in the future.

Commenters pointed to roast leach acid plant residue from primary copper processing, oil shale and tar sand processing wastes, and wastes from the processing of nodules collected from the ocean as examples of wastes that may qualify for the Bevill exclusion in the near future under the proposed criteria.

These commenters also asserted that EPA should study and issue regulatory determinations for wastes that may meet the special waste criteria in the future. They also argued that it is more appropriate to define the scope of the Bevill exclusion for mineral processing wastes directly using the criteria and not create a list of wastes that EPA has determined meet the criteria. Applying the criteria to additional waste streams in the future would allow for the effects of changing market conditions and new mineral processing technologies. Some commenters thus recommended that EPA amend the proposed rule to include a provision whereby if a waste qualifies as a high volume/low hazard waste in the future, it would become subject to the provisions of the Bevill Amendment.

The Agency has considered these comments and decided to maintain its proposed approach of a one-time reinterpretation of the Bevill exclusion for mineral processing wastes. As discussed in the April proposal, EPA interprets the legislative history as clearly establishing a temporary exclusion through the Bevill Amendment over a fixed time period. In fact, the statutory language includes explicit time limits on the Bevill exclusion which apply to the submission of the required Report to Congress and subsequent regulatory determination. Moreover, the Court of Appeals decision stipulates an updated timetable for completion of the study and the final regulatory determination.

In today's final rule, wastes not presently being generated or currently meeting the high volume/low hazard standard will not be considered for special waste status in the future. Thus, EPA is making a one-time reinterpretation of the Bevill exclusion for mineral processing wastes by providing a specific list of such wastes that tentatively fall under the "special waste" criteria. EPA further maintains that the one-time reinterpretation is not contrary to the interests of industry or the environment. New wastes generated in the future will be regulated under either the subtitle C or subtitle D regulatory programs, thus industry will know in advance the regulatory standards that will be applied to new mineral processing wastes. EPA does not believe that failure to apply the

Bevill Amendment to future waste streams will discourage treatment of these wastes; the application of Subtitle C or D will, in many cases, create exactly the opposite incentive. Thus, this position is consistent with recent EPA policy initiatives that encourage the development of process changes and new waste treatment technologies that minimize hazardous waste/treatment residual generation.

Certain commenters took issue with EPA's assertion that the Report to Congress on Bevill wastes identified in today's rule would be the last under section 8002(p). They argued that EPA is under a continuing statutory duty to study and Report to Congress under sections 8002(f) and 8002(p) of RCRA regarding wastes from the extraction and beneficiation of ores and minerals in sectors not discussed in detail in EPA's 1985 report entitled "Wastes from the Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden from Uranium Mining, and Oil Shale" (Dec. 31, 1985). These commenters cited pages from a draft EPA report (which was never completed or released to the public) on wastes from certain mineral processing operations. In that draft report, the commenters allege, EPA committed to further study of wastes from the extraction and beneficiation of certain nonmetallic ores and minerals.

EPA disagrees that it is necessary for the Agency to commit to further studies of extraction and beneficiation wastes under section 8002(p). EPA believes that the 1985 Report, and the subsequent regulatory determination, discharged its statutory duty with respect to all extraction and beneficiation wastes. As explained in the Executive Summary to the 1985 Report, the Report specifically addressed "wastes from the extraction and beneficiation of metallic ores (with special emphasis on copper, gold, iron, lead, silver and zinc), uranium overburden, and the nonmetals asbestos and phosphate rock." Oil shale wastes were also addressed in an Appendix. EPA explained that it "selected these mining industry segments because they generate large quantities of wastes that are potentially hazardous and because the Agency is solely responsible for regulating the waste from extraction and beneficiation of these ores and minerals." Report to Congress, page ES-2. However, the Report is not limited solely to wastes from these identified sectors. Rather, the Report considers waste generation, waste management, health and environmental risks, and regulatory impacts on the entire nonfuel mining and beneficiation industry. See,

e.g., Report, pages ES-3, ES-4 (overview of the nonfuel mining industry), ES-10 (potential dangers posed by the nonfuel mining industry), and ES-14 (potential costs of regulating mining wastes as hazardous).

EPA's 1986 Regulatory Determination also clearly states that it covers all mineral extraction and beneficiation wastes. As EPA said at the time, "this notice constitutes the Agency's regulatory determination for the wastes covered by the Report to Congress, i.e., wastes from the extraction and beneficiation of ores and minerals." 51 FR 24497 (July 3, 1986). The Regulatory Determination went on to explain that, by contrast, Bevill mineral processing wastes (based on EPA's 1985 proposal) "were not studied in the mining waste Report to Congress and therefore, are not covered by this regulatory determination." *Ibid.*

EPA believes that the Report to Congress and Regulatory Determination make clear the Agency's intent that wastes from the extraction and beneficiation of ores and minerals are to be regulated under subtitle D. Accordingly, EPA has no present plans to conduct any further studies under 8002(p) or make any further regulatory determinations. EPA's draft Report to Congress cited by the commenters was an internal pre-decisional document and does not represent the final Agency policy on this issue. (EPA also has no plans to complete or submit that Report in any form; its relevance was rendered moot by the decision in EDF II.)

3. Retroactive Application of Subtitle C Requirements

In the April NPRM, EPA stated explicitly that subtitle C regulation arising from the withdrawal of Bevill status from most mineral processing wastes would not be imposed retroactively. That is, Subtitle C requirements would apply only to newly generated or actively managed mineral processing wastes that are removed from the Bevill exclusion and that exhibit one or more characteristics of hazardous waste, not to existing accumulations of these materials unless they are actively managed after the effective date of the rule or are subject to regulation as waste mixtures, as discussed in further detail below. This is consistent with standard Agency policy regarding the imposition of new regulatory requirements.

Commenters disagreed on the appropriateness of this approach. One commenter supported the approach, while another stated that the lack of regulation of previously disposed

mineral processing wastes would not be protective of human health and the environment. Most comments on the retroactivity provision, however, centered around the definition of "active management." Several commenters requested clarification of this term.

In keeping with the April proposed rule, today's final rule does not impose Subtitle C requirements (such as those for closure and post-closure care) on mineral processing wastes that were disposed prior to the effective date of today's rule, unless they are actively managed after the effective date. This provision ensures that those mineral processing wastes that were originally excluded from subtitle C under the Bevill exclusion, and are now considered hazardous under the reinterpretation of the Bevill exclusion, are not subject to subtitle C requirements if the wastes were disposed prior to the effective date of the final rule. EPA is maintaining its proposed approach largely because of its long-standing policy of not regulating wastes under RCRA that were disposed prior to the effective date of a rule governing those wastes. See, e.g., 45 FR 33066.

For purposes of this rule, EPA views active management as physically disturbing the accumulated wastes within or disposing additional non-Bevill hazardous wastes into existing waste management units after the effective date of this rule. EPA does not intend to bring under subtitle C regulation existing waste management units containing wastes now identified as non-Bevill to which only Bevill wastes or other non-hazardous solid wastes are subsequently added (i.e., this practice will not constitute active management of the non-Bevill waste(s)). For example, a waste management unit receiving a high volume slag excluded from Subtitle C regulation under today's rule may continue to receive additional slag (or other non-hazardous or Bevill waste stream) even if it has also received (prior to the effective date of the rule) hazardous waste now identified as non-Bevill, provided that no additional non-Bevill wastes that exhibit characteristics of hazard or are listed as hazardous are managed in these units. Continued use of an existing unit after the effective date of this rule for treatment, storage, or disposal of additional quantities of a newly listed or characteristic hazardous waste will be considered active management and will subject the entire unit and its contents to Subtitle C regulation.

4. Scope of Today's Rule

In the April notice, EPA stated clearly that its interpretations and definitions regarding the regulatory status of mineral processing wastes under the Bevill Amendment applied only to the wastes addressed in this series of rulemakings (i.e., mineral processing wastes).

Nonetheless, commenters contended that the Agency's position as articulated in the 4/17/89 NPRM with respect to the actual or potential status of coal combustion wastes was unclear. They stated that some of the interpretations and definitions proposed for mineral processing wastes would not be appropriate for application to coal combustion wastes (another Bevill special waste category), particularly the high volume and low hazard criteria presented in the April NPRM, and requested that EPA clarify its position on this issue.

EPA emphasizes that the applicability of the definitions and criteria interpretations contained within this rulemaking, as presented below, is confined only to mineral processing wastes. The Agency believes that the special wastes concept remains a flexible one, and that the criteria for defining special wastes in the mineral processing industry may not be directly transferable to the other special waste categories, particularly coal combustion wastes. (EPA noted differences in its discussion of coal combustion waste volumes in the October, 1988 NPRM.) The Agency will consider this issue further in the context of its Regulatory Determination for coal combustion wastes.

B. The Low Hazard Criterion

As discussed in the preamble to the April 17, 1989 NPRM, EPA has proposed a hazard criterion for use in determining the proper scope of the Bevill exclusion as it applies to mineral processing wastes. The purpose of the hazard criterion is to identify candidate Bevill mineral processing wastes that clearly do not present a low hazard to human health and/or the environment. Any wastes failing such a criterion should be immediately removed from the Bevill exclusion; these wastes would then be evaluated (just like any other solid waste) to determine whether they are hazardous—that is, whether they are listed or exhibit any of the hazardous waste characteristics.

The proposed hazard criterion was based on two types of tests: (1) A pH test and (2) a mobility and toxicity test. The pH test requires that a mineral processing waste have a pH between 1

and 13.5 to be considered an exempt special waste, which represents a one order of magnitude increase of the pH levels used to identify corrosive hazardous wastes (i.e., 2 and 12.5). The mobility and toxicity test requires that mineral processing waste constituents be extracted from the waste using a procedure (Method 1312—Synthetic Precipitation Leaching Procedure) that EPA believes is generally less aggressive in leaching out constituents from solid wastes than the EP Toxicity Test (Method 1310), which is used to determine whether non-Bevill solid wastes exhibit the toxicity characteristic. The waste extract is evaluated in the same manner and at the same regulatory levels as in the EP Toxicity test. As EPA explained in the April NPRM, the low hazard criterion is solely a preliminary screening device to determine which mineral processing wastes are special wastes, and will not be used in determining which wastes will subsequently be regulated under Subtitle C, either as a result of today's rule or in the upcoming regulatory determination.

Comments on the low hazard criterion are organized in this preamble into general comments on the appropriateness of the criterion, followed by general comments on the overall approach, and specific comments on potential components of the approach (i.e., pH test, ignitability and reactivity tests, mobility and toxicity test, constituents for testing, additional standards, application of tests, and types of information).

1. Appropriateness of Establishing a Hazard Criterion

Many comments were received on whether EPA should include a hazard criterion for identifying which wastes should not be subject to continued temporary exclusion from RCRA subtitle C requirements under the Bevill Amendment.

a. Low Hazard Criterion is Appropriate. Several commenters supported EPA's proposal to use a low hazard criterion. One commenter maintained that a low hazard criterion is appropriate provided that the test used to evaluate whether the low hazard criterion is met is reasonable and appropriate for use with mineral processing wastes. Another commenter stated that Bevill exclusion status should be awarded only to those wastes that meet both the volume and hazard criteria, and yet another commenter stated that EPA should immediately remove from consideration those wastes

that are clearly hazardous, without further study.

Many commenters believed EPA's proposed low hazard criterion is objective, currently feasible, and essential to ensure that wastes that are not low hazard are appropriately regulated. Furthermore, one commenter maintained, the Agency's proposal is a positive step toward environmental protection; high volume wastes, because of their quantities, must be carefully evaluated for their potential risk to human health and the environment.

b. Low Hazard Criterion is Inappropriate. Many commenters believed that the low hazard criterion should be abandoned because, they generally contended, EPA's proposal to use a pH test and a mobility and toxicity test for mineral processing wastes directly contradicts Congressional intent and the decision in *EDF I*

(*Environmental Defense Fund v. EPA*, 852 F.2d 1309 (D.C. Cir. 1988)), that hazard or hazard alone should not determine whether a waste falls within the scope of the Bevill Amendment. These commenters generally believed that the hazard/toxicity issue is better addressed within the special studies, not as a screening procedure, and/or that Congress intended for some characteristic wastes to be exempted from subtitle C regulation. Basically, these commenters argued that failure to pass the low hazard test should not deny a waste access to the detailed and comprehensive study and balancing of economic and environmental factors mandated by the Bevill Amendment.

EPA has re-examined the special waste concept, the regulatory and legislative history, and the Court decision prompting this rulemaking, and concludes that the hazard criterion described in the April NPRM, with some modifications, is appropriate for use in reinterpreting the scope of the Bevill Amendment. The Agency recognizes that a full and detailed assessment of hazard can and will be appropriately considered in a Report to Congress. Nevertheless, a test designed to identify any wastes that are clearly not low hazard wastes is a necessary and appropriate component of the criteria for identifying mineral processing wastes that should remain temporarily excluded from Subtitle C regulation by the Bevill Amendment. The utilization of a criterion to screen out wastes which are not low hazard is clearly required by the order of the Court of Appeals. See 852 F.2d 1331.

Some commenters supporting abandonment or substantial revision of the hazard criterion believed that EPA lacks the necessary data for adopting a

low hazard criterion. EPA believes, however, that sufficient data are available to develop a workable and appropriate low hazard criterion for screening purposes and to apply that criterion to some mineral processing wastes. For wastes with insufficient information, EPA currently is conducting an extensive data-gathering effort. The new data will be applied to conditionally retained Bevill wastes, and their regulatory status will be addressed in a proposed rule by September 15, 1989.

2. Overall Approach

a. Low Hazard Rather than High Hazard Wastes Should Be Identified. Several commenters stated that EPA should identify wastes that are clearly low hazard and keep them within the Bevill exclusion, rather than identifying wastes that are clearly not low hazard and removing them from the Bevill exclusion.

EPA disagrees with this approach primarily because it would be impractical given the time and other constraints that the Agency faces in promulgating this rule. The special study waste concept within the context of this rulemaking necessitates identifying, using a screening procedure, wastes that are clearly not low hazard. To identify wastes that are clearly low hazard would involve the type of study of damage case and other risk-related information that is planned for the Report to Congress, because before concluding that specific wastes pose low hazard, the Agency would require site-specific data on physical and chemical characteristics of the waste, the waste management practices employed, the proximity of the facility and its waste management units to sensitive environments (e.g., wetlands, endangered species habitat) and potential receptors, and other factors that affect waste-related risk.

b. Low Hazard Criterion Should Be Adopted Based on a Multi-factor, Qualitative, and/or Site-specific Test. Some commenters indicated that a less quantitative approach for identifying wastes to remove from the Bevill exclusion should be utilized using an analysis of present management methods, environmental settings, and available damage cases, as well as of toxic and leachable constituents. For example, some commenters recommended that the Agency specifically consider information regarding past and current mineral processing waste management practices, which, the commenters stated, will clearly show that the wastes pose unacceptable risks to human health and

the environment. Other commenters stated that mineral processing facilities generally pose less risk [than other potentially hazardous wastes] because they are sited in dry climates, far from ground water and drinking water, and in unpopulated areas.

The Agency believes that a multi-factor, qualitative, and/or site-specific approach as suggested by these commenters is infeasible. Given the Agency's time constraints, the information described could not be systematically collected and considered to implement such a low hazard criterion uniformly for all of the various mineral commodity sectors and facilities addressed by this rule. Furthermore, development of such a criterion would be very subjective and difficult to apply consistently in such a short time frame. Rather, the scope of the Bevill exclusion will be defined using the hazard criterion (and the volume criterion) in lieu of obtaining site-specific data. Wastes that fail this screening test are clearly not low hazard and, therefore, will be subject to potential Subtitle C regulation. For wastes remaining in the Bevill exclusion, EPA will collect and analyze various kinds of additional data (e.g., damage cases, site-specific environmental and waste management factors) for the Report to Congress. This additional analysis will involve consideration of the factors identified by commenters, and will ultimately support a regulatory determination for the mineral processing wastes temporarily excluded under the Bevill Amendment using the criteria established by today's final rule.

c. Specified Tests Generally Are Appropriate. Several commenters felt that EPA's proposal to use a synthetic precipitation leaching procedure for mobility testing is appropriate. One commenter maintained that any hazard test should be less stringent than the subtitle C characteristics tests and should demonstrate whether a waste poses a clear and unambiguous hazard to health or the environment. This testing standard, the commenter further stated, is necessary because the hazard criterion will be used as a screening mechanism to determine which wastes warrant further study; wastes failing the low hazard criterion will be evaluated like any other solid waste to determine whether it should be subject to subtitle C regulation.

d. Specified Tests Generally Are Inappropriate. Many commenters believed that the proposed hazard tests are inappropriate, generally recommending one of three alternatives: (1) EPA should not modify the current

standards, (2) EPA should modify the current standards, and (3) EPA should not use a leaching test to assess mobility.

Many commenters arguing against modification of the standards stated that EPA's decision to modify the characteristics test is an extreme measure to ensure that no low hazard waste would be regulated under Subtitle C prior to detailed study, at the risk of allowing many high hazard wastes to escape such regulation altogether. One commenter argued that a less stringent measure of inherent toxicity should not be used when evaluating a high volume waste, because high volume wastes have a greater potential to release significant quantities of hazardous materials. The result of the proposed hazard criterion, according to the commenter, would be stringent regulation of small quantities of waste while at the same time almost unregulated disposal of wastes that have caused documented environmental damage.

Some commenters contended that the Agency should implement less stringent modifications to the hazard tests. For example, one of these commenters stated that the allowable constituent concentrations in the extract should be 300 times the primary drinking water standard, instead of 100 times the standard (as proposed). According to another commenter, the application of 100 times the MCLs for all chemicals uniformly is of questionable validity. Others believed EPA should use the EP Toxicity Test for screening, but increase the values for comparison by a factor of 100 (i.e., 10,000 times the primary drinking water standard). These commenters noted that (1) the EP Toxicity Test is well established and widely used and considerable data exists for mineral processing wastes and (2) a relaxation of two orders of magnitude of the comparison values is similar to the proposed relaxation of the pH standard, and has been adopted by EPA's Land Disposal Restrictions program for "California List" wastes.

Some commenters argued against the use of any type of leaching test because of the apparent failure of this test to consider either the actual waste management practices being used or any other site-specific factors. Another commenter stated that because of the shortcomings of leaching procedures, the classification of wastes as hazardous or non-hazardous should not be based solely on an acid extraction test. Another commenter contended that Method 1312 yields extraction information only, and that testing for the

mobility of a particular component can only be done by site-specific evaluation. One commenter argued further that the Method 1312 test only assesses mobilization of contaminants to ground water under accidental conditions; no other environmental media or exposure route is measured. Consequently, the commenter contended, the test does not provide a complete measure of a waste's potential hazard.

EPA has considered these comments and continues to believe that the low hazard criterion as proposed (i.e., the larger pH range and the more appropriate leaching procedure) is both necessary and appropriate for use as a screening tool. The Agency disagrees that this approach will leave highly hazardous wastes unregulated and free to contaminate the environment; in fact, just the opposite will happen—that is, wastes that fail the screening test will no longer be retained within the Bevill exclusion and will be evaluated like all other solid wastes as to their potential hazard. Wastes that pass the screening criterion test and are retained within the exclusion will be extensively studied, and a regulatory determination will be made as to their Subtitle C or D status within two years. Using the same toxicity factor as used in the EP Toxicity Test (i.e., 100 times the MCL) is appropriate because the attenuation and dilution expected for mineral processing wastes after release into the environment is expected to be similar to wastes managed at other industrial facilities; that is, the transport and fate of the toxic constituents should not be any different whether the waste is a mineral processing waste or some other type of solid waste. Moreover, although the standards set by statute under the land disposal restrictions program for "California List" wastes are 10,000 times MCLs, as the commenter noted, EPA has already proposed to amend these standards by using a multiplier of 100.

The Agency believes that a leaching test is the best way to assess waste contaminant mobility given the time and data constraints that EPA faces. Although EPA acknowledges that a leaching test generally only provides an indication of mobility in ground or surface water rather than in other media (e.g., air), this pathway is generally believed to be, for the purposes of this screening, the most indicative of the potential hazard posed by mineral processing wastes, and the most readily and consistently applicable to all mineral processing wastes, given the constraints of the Agency during this rulemaking. Other media will be assessed for the Report to Congress.

3. pH Test

a. *General.* Many commenters indicated that EPA's proposal to include a pH test was appropriate. Other commenters, however, felt that major modifications were needed for the corrosivity characteristic. For example, one commenter stated that the Agency should change its definition of the pH test for corrosivity so that it applies only to liquid wastes. Another commenter maintained that the approach should be revised because it is inconsistent with the Court's decision in *EDF I* that mining wastes exhibiting the characteristic of corrosivity, as defined in the RCRA Subtitle C regulations, may not pose a threat to human health and the environment. The application of a corrosivity hazard test to phosphate processing wastes, one commenter argued, would produce illogical and inappropriate results; it is only because aqueous phosphate waste streams are recycled that they ever consistently exhibit a characteristic of hazardous waste. This same commenter stated that for certain facilities, the pH may drop below 1.0 due solely to meteorological conditions.

EPA believes that a pH test is an appropriate indicator of hazard from liquid mineral processing wastes, regardless of whether the wastes were reused prior to their disposal. The comparison of the waste's pH to the proposed standard identifies wastes that are so corrosive that it would not be credible to consider them "low hazard" regardless of the industrial process used to generate the waste or the location of the facility.

The Agency does agree that the pH test should not be applied to non-liquid wastes. However, as discussed more fully below in section III, EPA has established a working definition of liquid and non-liquid wastes that considers the physical and chemical nature of mineral processing wastes on both an as-generated and as-managed basis. The distinction between liquid and non-liquid wastes is really significant, however, only when evaluating individual waste streams with respect to the Bevill volume criterion. Otherwise, as when analyzing waste samples in the laboratory, standard EPA definitions and protocols apply.

b. *Modification of the pH Standard.* Many commenters stated that the proposed increase of the pH range by one order of magnitude (to a pH range of 1.0 to 13.5) is correct and should not be changed. Other commenters, however, felt that the range should be increased

even further, while some commenters felt that the range should not be increased beyond the characteristic test range (i.e., 2 to 12.5).

One commenter arguing for a further increase of the pH range stated that EPA's proposed lowering of the allowable pH level by only one pH unit (1) does not reflect the intent of the Bevill Amendment, (2) unfairly penalizes operations that have improved their treatment methods, and (3) contradicts EPA's own statement that the hazardous characteristics tests need not be determinative of Bevill status. Rather, EPA should adopt a lower pH standard of 0.5, which, this commenter believed, would have no appreciable effect on human health or the environment because of the limited migratory tendencies of mineral acids.

Two commenters supporting a further increase of the pH range argued that because mineral acids used in ore processing are not appreciably buffered, the relative acidic strength of the resulting wastes is overstated by the pH measurement; adding buffering agents simply to increase the pH above 1.0 is inappropriate because such an addition would interfere with resource recovery operations. One of these commenters illustrated the point by contending that iron chloride wastes, though exhibiting a very low pH value, would otherwise satisfy the low hazard screening criteria.

As discussed above, EPA believes that the comparison of the waste's pH to the proposed pH range satisfies the need to identify which wastes clearly are so corrosive that they do not merit continued regulatory exclusion and further study. The Agency does not find the above arguments advocating a further increase of the pH range convincing; any further increase in the pH range may result in wastes that are clearly not low hazard remaining in the Bevill exclusion, which may in turn compromise the protection of human health and the environment. For instance, the fact that mineral acids are not appreciably buffered does not alter the fact that wastes of such low pH may pose a hazard. In any case, today's rule will not create undue incentives to buffer mineral processing acids above the 1.0 level, since sampling of all high-volume wastes is now complete.

A commenter arguing for no increase of the pH range beyond subtitle C characteristic levels believed that (1) the proposed rule is arbitrary, (2) it will allow too many wastes to remain within the Bevill exclusion, and (3) EPA's primary goal of protecting human health and the environment will be compromised.

The Agency continues to believe that a one order of magnitude increase in the pH range is entirely appropriate as a screening criterion to determine which mineral processing wastes are clearly too corrosive to remain exempt pending detailed study. EPA also disagrees that environmental protection would somehow be compromised by failure to use the subtitle C pH range for purposes of identifying special wastes. EPA stresses that wastes remaining under the Bevill exclusion still will be evaluated further for specific hazard (including corrosivity) during development of the Report to Congress.

4. Ignitability and Reactivity Tests

Many commenters supported the Agency's tentative position to not screen mineral processing wastes for ignitability or reactivity. Some noted that the RCRA hazardous characteristics tests for ignitability and reactivity are not readily adaptable for a screening function and, particularly in the case of reactivity, are far too subjective to be employed in the manner proposed for the low hazard determination. One commenter argued that the RCRA tests for ignitability and reactivity should not be used to judge low hazard because they fail to identify unambiguously high hazard mineral processing wastes. Another commenter noted that ignitability is irrelevant to most mineral processing wastes because most of these wastes tend to be earthen or aqueous.

For three main reasons, EPA agrees that the RCRA tests for ignitability and reactivity are not appropriate and should not be used in the low hazard criterion: (1) The Agency currently has little or no actual data on the potential reactivity or ignitability of most mineral processing wastes, (2) the tests for ignitability and reactivity, because of their nature, cannot be readily modified for use as part of a screening criterion to identify wastes that are clearly not low hazard, and (3) despite the paucity of actual test results, the Agency does not believe, based upon best engineering and professional judgment, that mineral processing wastes are particularly ignitable or reactive.

5. Mobility and Toxicity Test

The majority of comments on the hazard criterion addressed the proposed mobility and toxicity test. For purposes of this notice, these comments are organized into appropriateness of (1) the EP Toxicity and TCLP Tests, (2) the proposed Method 1312, and (3) other types of tests.

a. *EP (Method 1310) or TCLP (Method 1311) Tests.* Many commenters

supported EPA's contention that more appropriate tests than Methods 1310 or 1311 may exist for evaluating mobility and toxicity. Both of these tests are based on an assumption that, under a plausible worst-case mismanagement scenario, wastes might be co-disposed with municipal solid wastes, and several commenters argued that this disposal scenario is implausible for mineral processing wastes. The EP Toxicity Test, one commenter stated, does not correctly represent other conditions experienced by the mineral processing industry, such as low precipitation and high waste volume. Some commenters noted that this same argument should apply to mineral processing wastes removed from the Bevill exclusion, which, they stated, would be in contrast to EPA's statement in the April NPRM that mineral processing wastes removed from the Bevill exemption will be subject to Subtitle C if they exhibit EP toxicity, and that the EP test may be used to determine whether Subtitle C requirements qualify as "applicable or relevant and appropriate requirements" at CERCLA sites.

Other commenters disagreed, however, with EPA's proposal not to use the EP Toxicity Test. These commenters noted the test's well-established reputation, and the large amount of data already collected by the Agency. EPA proposed Method 1312, they argued, without demonstrating the inadequacy of the EP or TCLP tests (e.g., EPA has not demonstrated that the EP or TCLP tests significantly and consistently overestimate leaching of metals from mineral processing wastes). These commenters went on to note that the argument that monofill disposal implies that the EP test is inappropriate for mineral processing wastes clearly was rejected by EPA in promulgating the EP test in 1980. Furthermore, the commenters stated, not using the EP test because of the nature of the extraction medium falsely assumes that each processing waste is disposed of in a manner that precludes it from coming into contact with other processing or mining wastes when, in fact, there is strong reason to presume an acidic disposal environment. These commenters contended that (1) many mining and metallic ore processing wastes have significant acid generating potential (which may result in very acidic conditions, even in a monofill), (2) many wastes are stored or disposed in unlined units, (3) many sites are located in conjunction with mining and other similar activities, (4) many exempted wastes are themselves acidic, and (5) EPA's use of a 100-fold dilution/

attenuation factor is sufficiently modified to account for variability in leaching conditions. EPA, they believed, should consider that exposure of non-acidic wastes to acidic conditions through commingling with other wastes, leachate, or contaminated runoff is a highly plausible scenario and certainly a reasonable worst-case scenario.

The Agency acknowledges the well-established reputation of the EP Toxicity Test and the large amount of EP extract data for mineral processing wastes, but nevertheless believes that the EP and TCLP tests and data generally are inappropriate for identifying mineral processing wastes which are "clearly not low hazard" under today's screening process and thus should be removed from the Bevill exclusion. The purpose of the EP and TCLP tests are to determine which solid wastes are "hazardous wastes" under sections 1004(5) and 3001(a) of RCRA; by contrast, today's hazard criterion determines only whether a waste should be temporarily excluded from regulation under section 3001(b)(3).

EPA agrees that mineral processing wastes may be disposed in acidic environments; however, the acids to which they will usually be exposed are mineral acids, rather than organic acids such as that used in the EP and TCLP tests. This fact is central to EPA's use of Method 1312 for evaluating the hazard of mineral processing wastes. In contrast to the disposal of municipal refuse, mineral processing wastes are unlikely to be managed in environments that contain or are capable of generating organic acids, such as the acetic acid formed by decaying garbage; mineral processing wastes, with very few exceptions, do not contain appreciable quantities of organic matter. Thus, EPA believes that use of the EP or TCLP would identify certain mineral processing wastes as not low hazard which EPA believes are appropriate for further study under section 8002(p).

Concerning the use of existing EP/TCLP extract data, and as stated in the April NPRM and discussed in Section III of this preamble, EPA will use existing EP extract data to help evaluate whether a waste stream which fails the basic toxicity test (using Method 1312) should nonetheless remain within the Bevill exclusion under certain conditions. EPA believes that use of EP/TCLP extract data in this fashion is appropriate to account for possible anomalies in the Method 1312 results, since EPA concedes that Method 1312 has not been used in a significant number of past cases.

As already stated, waste streams that are removed from the Bevill exclusion

because they do not meet one or more of the Bevill criteria are not special wastes, and will be evaluated for possible regulation under subtitle C in the same manner as any other industrial solid waste. EPA believes that use of the EP (or, in the near future, the TCLP) is appropriate for non-Bevill mineral processing wastes removed from the exclusion today because EPA does not have reason to believe that the worst-case mismanagement scenario would be implausible for such low-volume wastes. Thus, these tests are appropriate for determining the hazardous characteristics of particular waste streams that are potentially subject to regulation under RCRA section 3001 without further study.

Commenters arguing for use of the EP Toxicity Test also noted several sources of information that indicate that the use of organic acids may affect the leaching of lead differently than of other metals. In addition, they stated, the reproducibility of these test procedures could be adversely affected with respect to lead. They noted one study that suggested that in cases in which lead was the only constituent that leached above regulatory thresholds, an additional test (e.g., using sulfuric acid) should be used to eliminate the effect of organic complexation while still retaining the acidic conditions. One group of commenters postulated the inappropriateness of Method 1312 (and argued for a more aggressive leaching method) by citing a certain study's evaluation of the waste extraction test (WET) and possible alternatives. This study, they said, demonstrated that tests other than WET—similar to Method 1312 according to one commenter—suffer from very low or no ionic strength and buffering capacity. The study authors, they contended, rejected claims that organic acids employed by WET, EP, or TCLP are overly aggressive.

EPA recognizes the potential differential treatment of the EP test with respect to lead-containing wastes (because of the organic acid used in the test). But, because Method 1312 does not use an organic acid, this difference is not expected to be a problem. In fact, recent results of comparisons between Methods 1310 and 1312, which EPA examined to respond to these comments, indicate that the difference in aggressiveness between the two methods with respect to lead is greater than the difference with respect to other contaminants. (See below for additional discussion on this point.)

One commenter argued that the use of a deionized water extraction test to measure inherent toxicity of smelter slag is inappropriate because deionized

water generally exerts minimal extraction from slags and does not reflect conditions to which slag is exposed in the natural environment. Other commenters, however, argued that deionized water extraction is well tested and is mild enough to screen out only the highly hazardous wastes which, they contended, are the only wastes that EPA should be trying to eliminate from the exclusion at this time. A neutral water method, one commenter went on to state, is an appropriate basis for evaluating which wastes removed from the Bevill exclusion meet the criteria for hazardous waste regulation.

As indicated in the April proposal, the data from deionized water extraction tests were used as surrogates since there was very little data on mineral processing wastes available at the time using Method 1312. However, Method 1312 uses simulated acid rain as a leaching fluid to attempt to reflect conditions in the environment. For this reason, EPA believes that it is a more accurate screening tool than would be the deionized water extraction method. While Method 1312 is expected to be slightly more aggressive than the deionized water extraction test, it is still expected to be less aggressive than the EP toxicity test, and hence, more appropriate as a screening tool.

Since the proposal, EPA has collected samples of all potentially high volume mineral processing wastes for analysis using Method 1312. EPA has been able to complete laboratory analyses of samples from seven of the nine high volume wastes for which EPA used deionized water or EP toxicity data to propose hazard determinations in April. Now that the Method 1312 data are available, the Agency need not rely solely on neutral water or other test data. EPA notes here that the new sampling and analytical data obtained using Method 1312 confirm the Agency's earlier findings with respect to which of the nine wastes are and are not low hazard.

b. Method 1312—Simulated Acidic Precipitation Procedure. Several commenters supported EPA's proposed use of Method 1312 for testing the hazardous leachability of mineral processing wastes. Some endorsed the move toward Method 1312 because they felt it was more appropriate than the EP Toxicity Test (although they believed that improvements could be made). Many others contended that, for a variety of reasons, Method 1312 was inappropriate for determining low hazard. The reasons noted related to general issues, as well as the method's supposed lack of representativeness of

the environmental conditions to which mineral processing wastes generally are exposed, the lack of available data to evaluate its accuracy, the contention that the method is not less aggressive than current methods, the questionable applicability of the method to local and/or mineral processing conditions, and finally a variety of specific technical issues. These comments are addressed in detail below.

i. *General.* Several commenters stated that Method 1312 was not finalized and could not be replicated. According to one commenter, EPA must abandon Method 1312 and instead rely on the RCRA section 8002(p) factors to study all mineral processing wastes.

EPA believes that, although Method 1312 was not finalized via a final rule at the time of the proposed rule, sufficient data were available in the docket to conduct an appropriate evaluation of the method's suitability as a mineral processing waste screening test. Furthermore, in response to these comments, EPA has examined additional data which have become available since the proposal (these data may be found in the docket for this rulemaking). In response to the suggestion that a RCRA section 8002(p) study should be conducted to evaluate hazard, and as discussed previously, EPA believes that a quantitative screening test is the most appropriate method for identifying wastes which are not low hazard, as required by the EDF II. The Report to Congress will be conducted only for the wastes remaining in the Bevill exclusion.

Many commenters stated that EPA should make the toxicity standards for liquid wastes less stringent because, as proposed, the Agency would be measuring low hazard at the same constituent concentration values used to determine whether a liquid waste exhibits a characteristic of hazardous waste; specifically, the method would impose the same criterion for liquid mineral processing wastes as would the EP Toxicity Test (Method 1310). This judgment is counter, they argued, to EPA's intention of developing a test to determine which wastes are clearly not low hazard, and is contrary to the ruling of EDF I, which maintained that the Bevill Amendment was designed to temporarily suspend regulation of special wastes under subtitle C, irrespective of whether they fail hazardous characteristic tests. As an alternative, some commenters recommended, EPA should adopt the approach used by Congress in identifying liquid hazardous wastes subject to land disposal restrictions.

Finally, several commenters suggested increasing by one order of magnitude the contaminant concentrations used to determine the hazardousness of the liquid.

EPA believes that an adjustment of the screening tool for determining which wastes containing less than 0.5 percent solids are not low hazard is inappropriate, because the purpose of the 100-fold increase of the MCL is to account for dilution/attenuation of the dissolved contaminants in the environment. As already indicated, the Agency believes that once contaminants are in dissolved form and available for dispersion in the environment, the same standard should be applied to evaluate their toxicity, regardless of whether the solution tested is a waste sample or a test extract.

ii. *Evaluating the Accuracy of Method 1312.* Some commenters stated that the limited tests that have been performed on Method 1312 focus on only two of the eight metallic constituents of concern (lead and cadmium) and, therefore, are not adequate to support application of Method 1312 to a wide variety of processing wastes. Furthermore, a commenter stated, the Agency should question the accuracy of the interlaboratory testing which compared Methods 1310, 1311, and 1312 only for the parameter of lead and gave no information regarding the effectiveness of these methods on the leachability of other elements. One commenter believed that Method 1312 is inadequate as a screening test because (1) the degree to which 1312 is less aggressive than 1310 is unknown and (2) many data that are available for waste streams using 1310 and 1311 will become unusable if Method 1312 becomes the test. This commenter, however, supported EPA's proposal that data from Methods 1310 and 1311 should be used to a limited extent if Method 1312 remains as the mobility and toxicity test.

As discussed above, EPA believes that both the previous and the current test data for Method 1312 adequately prove the usefulness of this method for the purposes stated. In addition, the effectiveness of Method 1312 (e.g., compared to Method 1310) on elements besides lead has been confirmed (supporting data may be found in the docket for this rulemaking). By definition, a screening test is designed to be accurate only to the extent that it separates out only those segments of a population (in this case mineral processing wastes) that clearly do not meet a certain set of criteria (in this case low hazard). EPA reiterates that Method

1312 is only being applied as a screening test to identify wastes that clearly are not low hazard and therefore do not qualify for a Bevill exclusion. Those wastes that do qualify will still be further evaluated to determine what controls are needed.

iii. *Applicability of Method 1312 to Mineral Processing Wastes and Soils.* According to several commenters, Method 1312 is inappropriate to determine the mobility of contaminants in mineral processing wastes and wastewaters because the method originally was designed for testing contaminant migration in soils.

EPA disagrees that Method 1312 is inappropriate for this or any other reason. The original purpose of Method 1312 is irrelevant to its purpose in this rulemaking, just as its purpose here is irrelevant to other rules that do not involve identification of wastes subject to the Bevill exclusion. For the reasons presented throughout this preamble and in the background document to this rulemaking, Method 1312 is believed to be appropriate for use on mineral processing wastes within the context of the Bevill exclusion hazard criterion.

iv. *Appropriateness of Method 1312 as a Modification of the Standard.* As stated previously, several commenters acknowledged Method 1312's appropriateness as a modification of the mobility and toxicity standard. According to some commenters, however, the use of Method 1312 would not represent a less aggressive standard and, therefore, would be contrary to Congressional intent. They contended that, contrary to EPA's claim, Method 1312 is not consistently less stringent than the existing hazardous waste characteristics tests; for example, in one EPA test, Method 1312 leached more lead than the EP Toxicity Test in 12 of 18 analyses conducted on two soil samples. Before Method 1312 is incorporated into a formal rulemaking, they stated, data should be gathered to unequivocally demonstrate that the leachate concentrations will not be greater than those obtained by Method 1310.

The Agency believes that, in general, Method 1312 will be less aggressive than the EP test and the TCLP test. The following excerpt is from the EPA test report referred to by the commenters as an explanation of the results for the two samples described by the commenters:

Method 1312, which is in essence a distilled water extraction solubilized very little lead except for the two North Carolina samples, 5 and 6, which contained very high levels of lead in the bulk soil. Results by Method 1310 for these same two soils were in general

agreement with the 1312 results because no acetic acid was added during the 1310 extraction of these two soils. That is, for both methods the extracting fluids were nearly identical for these two samples.

In other words, these two unusual soil samples from a Superfund site were both highly acidic and very highly contaminated. In this situation, the EP test and Method 1312 provided essentially the same results. It is also of note that the TCLP, which will replace the EP, was significantly more aggressive than either the EP or Method 1312 for these two samples. The results from these two samples and the conditions of the sites where they were collected are in contrast to the conditions typically found at and sampling results derived from mineral processing facilities, as indicated by EPA's recent sampling program and laboratory analyses using Method 1312.

v. Applicability of Method 1312 to Local and/or Mineral Processing Conditions. Some commenters stated that Method 1312 is not applicable to mineral processing operations located in certain areas because the pH of the testing medium is not representative of rainfall in those areas and would potentially yield erroneous results; furthermore, because many mineral operations are in arid areas, the Method 1312 procedure of saturating the waste sample in an acid solution for 18 hours is non-representative of these sites. Other commenters believed that Method 1312 will produce misleading results because it (1) unrealistically targets certain elements in Beville wastes, (2) produces leaching results that bear no relationship to actual management practices, and (3) fails to account for site-specific conditions. One commenter suggested that EPA allow the extraction fluid for mineral processing wastes to depend on the region of the country where the waste is managed (e.g., a pH of 4.4 could be used for east of the Mississippi, and a pH of 5.2 could be used for west of the Mississippi).

Although Method 1312 includes two different extraction fluids for soils to attempt to account for geographic variations in rainfall, this variation is appropriate only for evaluating in-place soils since their geographic location is known. For evaluating wastes for a national regulation, the Agency cannot assume that all of a particular waste will be generated and managed in any particular location or region. Therefore, to be conservative in protecting human health and the environment, the Agency will apply the pH 4.2 extraction fluid to all mineral processing wastes.

vi. Specific Technical Issues. A variety of specific technical issues were

presented by commenters. One commenter argued that EPA should abandon the use of the Zero Headspace Extractor (ZHE) in Method 1312 because its erratic results with the extraction of volatiles is a troubling source of unexplained variation. Another commenter arguing against the applicability of Method 1312 stated that the proposed batch test approach does not account for the time dependent and flow dependent kinetics of the mobilization of species from wastes and will overestimate the resultant concentrations when compared to a natural system.

In response to the first point, the Agency believes that it is unlikely that most samples will contain volatile organics at levels of concern, nor does the Agency plan on assessing volatile organics in metal processing wastes; thus, there is no reason not to use the ZHE with the test. Concerning the second point, EPA agrees that overestimates may result, but has already accounted for potential overestimation by the use of a multiplier of 100 for the drinking water standards that are used for comparison.

Many commenters addressed specific aspects of the leaching liquid that should be used for Method 1312. For example, will the extraction fluid be brought into equilibrium with the carbon dioxide in the air? If so, they stated, the buffering capacity of the fluid will change over time if the fluid is mixed and then stored. For consistency, therefore, the description of Method 1312 should state that the fluid is to be mixed immediately before use, or brought into equilibrium with atmospheric carbon dioxide.

Another commenter on the extraction fluid used for the Method 1312 test stated that a carbonic acid/sulfuric acid/nitric acid cocktail, which has been specifically prepared to simulate precipitation, should be used. Another commenter added that, if EPA were to use Method 1312, the extraction fluid volume should be increased from 20:1 to 50:1, or the MCLs should be increased for wastes which have pH's below those of the recommended extraction fluids. One commenter contended that there are technical difficulties in using the deionized water required by Method 1312. For example, the commenter stated, deionized water can have variable pH levels which could lead to inconsistent results. Some commenters stated that, rather than Method 1312, EPA should use ASTM D 3987 (a distilled water leach test) as a more appropriate screening test.

The Agency believes that Method 1312, as described in the background

document to this rulemaking, is appropriate as a screening test for mineral processing special study wastes. The current extraction fluid formulation has been adequately tested and does not need modification, and the rationale for reducing the stringency of the comparison toxicity levels for wastes with low pH levels is unclear. The statement that deionized water can have variable pH levels is sound, but this should not pose a problem because the pH is subsequently adjusted to reflect acid precipitation. Finally, given that Beville mineral processing wastes are by definition generated in large volumes, there is no justification for increasing the extraction ratio (e.g., from 20:1 to 50:1) to simulate actual environmental conditions when evaluating candidate wastes using Method 1312.

If EPA chooses to promulgate Method 1312, some commenters stated, it should address whether a particle size reduction step is appropriate or if the step creates additional surface area that artificially elevates leachability. Another commenter contended that EPA should replace the particle size reduction requirement in Method 1312 with the Structural Integrity Procedure because a number of mineral processing wastes exist as inert, monolithic wastes that are unlikely to be physically degraded in a landfill. This commenter stated that congressional floor debate indicated recognition of this fact. One commenter believed that the selected particle size in the proposed Method 1312 is not a good analog of the particle size distribution in spent ore materials from heap leaching, and another commenter stated that the concept of particle size reduction should be eliminated altogether from Method 1312 and wastes should be tested in their natural state.

The Agency believes that, with respect to particle size reduction, there is a wide variety of particle sizes among the candidate Beville wastes. In order to achieve analytical results that are broadly applicable across sites and over time, the particle size reduction step is necessary in order to ensure that the smaller particles in the waste as generated or after disposal are adequately represented and that the Agency has data with which to make regulatory decisions for an entire sector based upon sampling results from a small number of facilities.

c. Other Types of Tests. One commenter objected to the separate test proposed for wastes suspected of containing cyanides. The commenter contended that EPA must choose either the extraction solution proposed for

cyanide, or that proposed for metals; to propose a separate extraction solution to assess cyanide and metals singularly is illogical and technically incorrect. Some commenters stated that EPA should utilize a method developed by the California State Water Resources Board that estimates acid-forming potential of mining wastes, because EPA should not classify mineral processing wastes with significant acid-forming potential as low hazard. Acid Mine Drainage (AMD), the commenters contended, is one of the most serious environmental concerns at mining sites and is pertinent to the mineral processing waste issue given the potential for processing waste storage at mining sites and the potential for processing waste disposal sites to become acidified.

One commenter stated that an appropriate test for inherent toxicity should account for complexing as a release mechanism for metals; for instance, the ASARCO smelter located near Tacoma, Washington disposed slag in low lying areas rich in organic matter, which has resulted in high metals loadings being released into local waterways.

EPA disagrees with the suggestion that the separate test for cyanides be eliminated. Separate tests are appropriate, because metallic elements in solid samples must be acid-digested for analysis, while cyanides can be extracted using less aggressive methods. Acid digestion of cyanide-bearing materials is also dangerous, because it can generate deadly HCN gas. In order to both collect accurate analytical data and protect laboratory personnel, EPA will continue to use separate testing methods. The Agency agrees that acid mine drainage is one of the most serious environmental concerns at mining sites. At this point, however, the Agency is only applying a screening test (Method 1312) to identify those wastes which clearly do not qualify for the special waste exclusion. Those wastes that do qualify will be further studied to determine the need for additional controls, and the acid-forming potential of those wastes is one of the factors that will be evaluated. Finally, the Agency believes that it is technically infeasible to consider factors requiring site-specific data, such as organic complexation of metallic contaminants, in a screening test. This and other risk-related variables will instead be considered for the Report to Congress on wastes retained within the Bevill exclusion.

6. Constituents for Testing

a. *Constituents Proposed in Mobility and Toxicity Test.* Some commenters

stated that a major problem with the proposed constituents to be used in the mobility and toxicity test is that no distinction is made between the hexavalent and trivalent forms of chromium, which is important given that EPA has described hexavalent chromium as the more toxic form. One commenter noted that EPA has (1) decided to consider only hexavalent chromium concentrations when listing solid wastes as hazardous wastes and (2) excluded from Subtitle C regulation wastes that fail the EP Toxicity Test due primarily to the presence of trivalent chromium. The commenter claimed that the Bevill status of wastes associated with the processing of titanium ore which contains only trivalent chromium would be affected by the proposed approach.

EPA believes that total chromium concentration is a more valid and environmentally protective indicator of hazardous potential than is a measure of hexavalent chromium, principally because chromium-bearing wastes may be exposed to oxidizing conditions in the environment (which would transform trivalent chromium to hexavalent chromium). Therefore, measuring only hexavalent chromium in mineral processing wastes on an as-generated basis might yield an inaccurate indication of (i.e., understate) actual degree of hazard. Thus, EPA will continue to compare total chromium leachate concentrations to the health-based level for hexavalent chromium. This same concern is reflected in EPA's proposed Toxicity Characteristic rule (51 FR 21648), and was the primary basis upon which six low volume mineral processing wastes were listed (53 FR 35412) in response to the same federal Appeals Court ruling that precipitated this rulemaking (EDF II).

Another commenter stated that EPA should modify the low hazard test so that it focuses on a narrower range of constituents than the EP Toxicity Test. For example, they stated, silver poses no threat to human health and should not be considered hazardous; EPA's proposal to delete the MCL for silver under the SDWA is further evidence that silver is not hazardous.

EPA maintains that the basis for developing the low hazard criterion is the existing evaluation of the four factors (EP toxicity, corrosivity, ignitability, and reactivity) used to identify characteristic hazardous wastes. Silver is one of eight metals included in the EP toxicity test, which is designed to assess potential risk by comparing contaminant concentrations with human health-based standards.

Because the Agency has not taken final action reflecting a decision to eliminate silver as a contaminant of concern, EPA will continue to utilize measurements of silver concentration as an element of the low hazard criterion.

b. *Other Constituents.* Several commenters stated that EPA should incorporate additional MCLs or other health standards, such as reference doses, particularly for incorporating fluoride, cyanide, manganese, and nickel into the low hazard criterion. Another commenter believed that it would be highly inappropriate to incorporate additional constituents or measurements beyond the existing EP toxicity contaminants in the mobility and toxicity test.

Remaining comments on the question of other contaminants focused on whether EPA should include radionuclides as a constituent for evaluating the hazard potential of phosphogypsum and other processing wastes. Many of those favoring the inclusion of radionuclides stated that data demonstrate that several wastes generated by the elemental phosphorus sector (furnace scrubber blowdown, process wastewater, and slag) and by the phosphoric acid sector (e.g., phosphogypsum and process wastewater) have leached radium-226 and/or gross alpha particle radioactivity at levels exceeding 100 times their respective MCLs. In the latter case, they noted, alpha radioactivity leached at levels exceeding 1000 times its MCL. Another commenter argued that based on existing cancer incidence data, any waste containing 5 pCi/g or more of radium-226 should be considered hazardous. In addition, the commenter noted, EPA has recognized that phosphogypsum has radium-226 concentrations consistently in the range of 25 to 35 pCi/g.

One commenter questioned any inclusion of radionuclides as a constituent for evaluating the hazard potential of phosphogypsum because of the proposed rule regarding the National Emission Standards for Hazardous Air Pollutants (NESHAPS), which addresses the regulation of radionuclides. The analysis described in that proposed rule, the commenter noted, should satisfy any valid concerns regarding residual radioactivity from phosphate industry wastes, and potential groundwater contamination could be addressed by the RCRA section 8002(p) study.

One commenter argued that there is no basis in RCRA for consideration of radioactivity in determining low hazard; radioactivity is not a characteristic of hazardous waste under Subtitle C, and it

must not be used. Phosphogypsum, according to this commenter, may exhibit radioactivity because of naturally occurring radionuclides, but both Congress and EPA have already given the radiological aspects of phosphate processing extensive consideration, making it unnecessary for the Agency to establish a "bright-line" test for radioactivity.

Another commenter stated that screening mineral processing waste streams out of the Bevill exclusion based solely upon radioactive characteristics without developing standards relevant to the harmfulness of these wastes would not be appropriate because the waste would subsequently fall under Subtitle C regulation, which may not be applicable to radioactive waste; a facility that had a waste removed from the Bevill exclusion might be required to incur substantial expense without public health benefit.

EPA believes that radioactivity and other constituents suggested by commenters should not be included as components of the hazard criterion because they are not addressed in the hazardous waste characteristic tests, which are the cornerstone of and reference point for the low hazard criterion. EPA believes that it would be logically inconsistent to remove a waste from the Bevill exclusion during this screening on the basis of a hazard characteristic that would not, by itself, cause the waste to be regulated under subtitle C. These constituents will, however, be considered in the detailed studies that will underlie the Report to Congress on Bevill mineral processing wastes. Accordingly, the potential risk posed by the radioactive or other nature of any of these wastes will be addressed in detail within the next year. EPA plans to utilize data developed for the radionuclide NESHAP as part of this evaluation.

7. Additional Standards

Many commenters stated that, although the Agency's use of MCLs to measure hazard to human health is supportable, a major deficiency in the approach is the use of the MCL for arsenic (a frequent constituent of processing wastes) in evaluating human health risk; arsenic's carcinogenicity mandates a more stringent standard for human health. Specifically, a 10^{-6} risk level for arsenic was suggested. These commenters also contended that EPA should not rely solely upon the MCL, but instead utilize the lowest standard from among the chronic ambient water quality criteria, MCL, cancer risk level, or oral reference dose for given substances, and then apply the 100-fold

dilution factor to establish an appropriate low hazard standard. In addition, these commenters stated, the proximity of many processing sites to drinking water supplies, underlying groundwater, and human populations, as well as numerous damage cases demonstrating risks to public health, argues for a measure of hazard that directly addresses human health.

Commenters also stated that many substances present in processing wastes are more toxic to aquatic organisms than to humans. Moreover, MCLs do not exist for some toxic substances whereas ambient water quality criteria have been developed for many additional substances. Furthermore, EPA has stated in the uncompleted 1988 draft Report to Congress on selected mineral processing wastes that all of the potentially hazardous wastes studied had constituent leachate concentrations that exceeded ambient water quality criteria.

In addition, these commenters added, a number of the mineral processing wastes exceeded hazardous waste standards even when extracted with water. All the copper, zinc, and lead processing wastes, they stated, contain arsenic at levels that exceed a 10^{-5} lifetime cancer risk level; even the minimum concentrations of copper process wastewater, copper acid plant blowdown, copper bleed electrolyte, and zinc process wastewater sampled exceeded this cancer risk level.

In contrast, several commenters stated that for a variety of reasons EPA should not use additional standards. One commenter stated that an aquatic organism or radiological standard should not be used because aquatic organisms and radiological concerns are amply addressed by statutes other than RCRA. Another commenter stated that the aquatic organisms standards are inappropriate for the following reasons: RCRA is almost exclusively a human health-based program; the protection of aquatic organisms is not an integral part of RCRA; other statutes protect aquatic organisms; and mineral processing waste streams are often closed-loop and entirely contained within the facility.

Although the Agency strenuously disagrees with the contention that the scope of RCRA is generally restricted to protection of human health rather than more broad additional protection of the environment, it has decided not to augment the standards that were presented in the April notice. Part of the reasoning behind this decision is not that these standards are irrelevant, but that applying them requires site-specific data that are not currently available for

most candidate mineral processing wastes. For example, applying Ambient Water Quality Criteria in any realistic way requires site-specific information on the flow of potential receiving waters, which vary over many orders of magnitude between sites. A more important argument, however, for retaining the standards proposed in April is related to the argument presented in the previous section on other constituents: EPA believes that other standards and criteria suggested by commenters should not be included as components of the hazard criterion because they are not addressed in the hazardous waste characteristic tests, which are the basis for the low hazard criterion. During the Report to Congress, however, many of the additional standards and criteria referred to by commenters will be addressed.

8. Application of Tests

Some commenters disagreed with EPA's proposal that wastes fail (i.e., are removed from the Bevill exclusion) when two or more facilities fail the hazard criterion. Many believed that the proposed "two-facility" decision rule is not stringent enough and the proposed plan to sample waste streams and apply Method 1312 ignores existing data, while others argued that the proposed application of the tests would be arbitrary and capricious. One commenter questioning the statistical accuracy of the "two-facility" test suggested that EPA sample a significant majority of the waste streams. Another commenter added that even if one could accept the statistical validity of making a recommendation based upon only two samples, the samples used in the test may have demonstrated entirely different characteristics; for example, one of the samples could have represented Missouri ores and the other Western ores.

The Agency stresses that it must make decisions, using limited data and within certain time constraints, about the degree of hazard posed by mineral processing wastes. Therefore, the screening approach described in the April NPRM and refined in today's preamble was developed to identify wastes that clearly are not low hazard and therefore should not remain within the Bevill exclusion. In response to comments, EPA has refined the hazard criterion to allow for the use of additional relevant data when a waste is generated at five or more facilities (see section III for details). Moreover, EPA has collected additional data on the nine high volume wastes for which the Agency proposed unconditional

Bevill exclusion decisions in April. Data on other candidate Bevill mineral processing wastes will not be available until the September proposal.

The "two-facility" rule, the Agency believes, is appropriate when either (1) substantial additional relevant data are not available or (2) less than five facilities generate the waste. In the latter case, the rule translates into the question of whether half or more of the facilities generate a mineral processing waste that fails the comparison of the Method 1312 extracts to the toxicity levels. The Agency believes that the "two-facility" rule is a reasonable balance between too much and too little stringency. As for whether failure for different constituents at different facilities proves the inadequacy of the two-facility test, EPA believes that this type of situation is precisely why the low hazard criterion (and the characteristics tests upon which it is based) contains multiple factors. It matters little why a particular waste is not low hazard at one site or at multiple sites. What is important is that EPA has a method of identifying the mineral processing wastes that are not low hazard, for whatever reason.

EPA, one commenter noted, should require that the pH values for comparison be the average of a statistically valid number of samples that are representative of the waste stream; otherwise non-representative samples could incorrectly label an entire waste stream as hazardous. The Agency believes, however, that using the median rather than the average of the pH values when more than two samples are available for a facility is more appropriate because pH is measured on a logarithmic scale; the average of the anti-logs of multiple values will always be dominated by the lowest value.

Some commenters recommended that EPA determine that a processing waste passes the low hazard criterion if it passes the criterion for any single facility generating that waste. The Agency believes, however, that this approach would be insufficiently protective and exempt wastes which are clearly not low hazard at a significant number of facilities.

9. Types of Information

a. Constituent Information. Several commenters argued that a new sampling effort is inappropriate because the Agency already has compiled information on processing wastes in the phosphoric acid, tin, and titanium ore processing sectors; in addition, this information indicates frequent and large exceedances of the EP characteristic trigger levels. These commenters also

argued that EPA already has extensive EP and water leaching data (in the draft Report to Congress) on processing operations in the copper, lead, zinc, and bauxite sectors, and, therefore, the Agency need not conduct a wholly new sampling effort.

EPA reiterates that it does not have adequate information to evaluate most candidate Bevill mineral processing wastes against the hazard criterion developed for this rulemaking (i.e., mobility and toxicity test using Method 1312), which EPA believes is the most appropriate test for this purpose. Therefore, a new sampling and waste characterization effort is vital if the Agency is to apply the hazard criterion and complete the rulemaking process. As discussed elsewhere in this preamble, existing EP toxicity or other data may be used if necessary.

One commenter recommended that appropriate testing methods for determining low hazard consider the hazard of the waste deposit as a whole (i.e., including older waste) and not just the new waste entering the deposit for the following reasons: (1) Time is important in stabilizing the waste; (2) the environmental concern is for influences and releases over an extended period of time; and (3) it is much more likely that long-term leaching behavior rather than immediate release will be important.

The low hazard criterion is designed to be a screening test that uses readily obtainable data. Conducting statistically meaningful sampling and analysis of large quantities of existing material (hundreds of millions of tons at some facilities) is well beyond the proper scope of such a screening test. Moreover, because the removal of the Bevill exclusion will not be applied retroactively (as discussed previously), the Agency believes that characterizing wastes as they are generated is far more relevant to addressing the low hazard criterion than are analytical data on accumulated wastes. As indicated above, data on older waste when it was generated may be used in specific situations.

b. Damage Information. Commenters stated that damage cases examined by EPA (in the draft Report to Congress) revealed numerous instances of environmental contamination as well as human health risks created by processing waste sites. In addition, they contended, EPA has had a considerable volume of data on environmental contamination from processing sites since at least 1984. One example where this information should have been used, they stated, was EPA's proposed classification of lead slag as low hazard,

when out of the five active lead smelters, one lead smelter is on the Superfund National Priorities List and another has contaminated vegetation and stream sediments with heavy metals. Another commenter added that contamination caused by copper smelting slag in the Tacoma, Washington area has been documented in numerous reports: In 1983, a county health department issued a notice advising against consumption of bottom fish from the Hylebos waterway and against regular consumption of fish from other waterways in the area. The advisory, the commenter contended, was prompted by the presence of arsenic and lead in fish caused in part by smelting slag.

As indicated previously, EPA believes that, given the constraints of this rulemaking, site-specific information generally cannot be systematically considered within the hazard criterion and then applied uniformly to all of the various mineral commodity sectors distributed throughout the country. This information, however, may be considered to some extent in specific situations and definitely will be considered in detail during the study for the Report to Congress. The Agency appreciates information submitted in public comment concerning documented mineral processing waste damage cases.

c. Risk Information. Several commenters criticized the Agency's failure to include any risk assessment information within the low hazard criterion. By using laboratory tests exclusively, one argued, EPA disregarded current waste management practices and other important risk factors. Most minerals industry contaminants are heavy metals which are elements that cannot be destroyed or reduced to innocuous states as can organic contaminants. Thus, one commenter stated, consideration must be made in evaluating a low hazard criterion that the source itself is likely to provide the hazard. The commenter contended that to consider only the source is simpler and from a purely environmental viewpoint more acceptable, yet this approach is an inferior method of evaluating minerals industry wastes and is not in the public's best interest. Following the 8002(p) mandate to study risk, this commenter suggested, the Agency should adopt a performance-based regulation utilizing current monitoring, evaluation, treatment, and cleanup technology. Such an approach, the commenter argued, would have the advantage of considering the source and pathways at a site-specific level; the

Agency has proven that this is a viable approach by utilizing it with mining and beneficiation wastes.

Several commenters argued that EPA should consider the quantity of waste in evaluating its potential hazard. They suggested that the Agency should, through the use of a variable dilution-attenuation factor applied to high-volume wastes, incorporate a measure of waste quantity into its proposed criterion.

These commenters also suggested that EPA consider all environmental data to determine actual risk arising from mineral processing wastes. They provided data on locational characteristics of mineral processing sites in order to lend support to their argument that there is a need to consider environmental risk at least as carefully as risk to human health in evaluating processing wastes.

The Agency reiterates its position on the use of risk or other site-specific information in the application of the low hazard criterion; this type of approach is inappropriate due to time constraints and EPA's belief that the hazard criterion is a screening tool for mineral processing wastes and is not intended as a replacement for the detailed study required by statute. That study will incorporate information such as waste management practices, waste characteristics, and site characteristics.

C. The High Volume Criterion

The April 17, 1989 NPRM specified a high volume criterion to be used to identify high volume mineral processing wastes. This criterion superceded and modified the original high volume criterion contained in the 10/20/88 proposal. In the April notice, the Agency stated that a waste stream would be classified as a high volume waste if it is generated at an average rate of more than 50,000 metric tons per facility per year. To account for fluctuations in mineral commodity markets, the test was to be applied to the highest average generation rate during any one year between 1983 and 1988. The actual cutoff selected by EPA for the high volume criterion was based on large volume waste streams currently being managed under Subtitle C regulations.

1. General Comments

Several commenters objected to any use of a "high volume" criterion to determine Bevill status. In particular, one commenter argued that the criterion discriminates against those sectors which, by nature of their operations, are small or are operating at reduced levels in a depressed market. Another claimed that the use of only a high volume

criterion will lead to inconsistent results by removing from exclusion mineral processing wastes that Congress intended to include within Bevill and which would be likely to remain exempt following submission of the Report to Congress, while retaining in the exclusion some high volume wastes that may be subject to stricter regulation after study for the Report to Congress.

Another commenter argued that establishing a stringent high volume criterion as a screen for permanent exclusion from Bevill is inappropriate because it severely limits the regulatory options available to address particular waste streams. They maintained that the criterion should be construed liberally because retaining a waste under Bevill merely makes it eligible for study and a subsequent determination by EPA on whether the waste should be subject to Subtitle C regulation.

Several commenters recommended that EPA not rely solely on a volume criterion to determine Bevill status. They asserted that many factors were to be studied before mineral processing wastes were regulated and, in addition, that Congress intended low volume wastes which posed significant manageability problems to still be eligible for the Bevill exclusion. They argued that the Agency should consider those "high volume" issues unique to each industry that generates such wastes, including those characteristics unusual or unique to the mineral processing industry.

As discussed at length in the April notice, the Agency rejects these arguments as inconsistent with the Court's reading of legislative intent and as contrary to the special waste concept. Only waste streams that are truly "special wastes" are eligible for examination in the Report to Congress. The high volume criterion has always been central to the special waste concept and is a necessary and appropriate first screen in the final determination of a mineral processing waste's Bevill status. Other industry-specific factors relevant to mineral processing waste management will be considered in EPA's Report to Congress addressing those wastes that are high volume and low hazard.

2. Separate Volume Criteria for Liquid and Non-Liquid Waste Streams

In the April 17 NPRM, the Agency solicited comment on the use of separate high volume cut-offs for liquid and solid mineral processing wastes. Specifically, EPA suggested 1.5 million metric tons per year as a volume cut-off for liquid wastes. The consideration of a higher cut-off for liquid wastes was predicated

on the fact that industry routinely manages hazardous wastewater volumes in the millions of gallons per day per facility (i.e., well over one million metric tons per year), which is in marked contrast to non-liquid waste materials which are typically generated and managed in much smaller quantities.

Comments on a separate volume criterion for liquid wastes were varied. While some commenters stated that not only is a separate wastewater cutoff wholly appropriate, it should be much larger than 1.5 million metric tons, others contended that a separate criterion should not be employed at all.

Several commenters supporting a separate criterion for liquid wastes stated that EPA should employ a separate volume criterion for liquid wastes higher than the proposed 1.5 million metric tons per year. They asserted that the proposed 50,000 metric tons per year threshold cannot be justified for liquid wastes even at average hazardous waste treatment, storage, and disposal facilities (TSDs); there must be a separate liquid volume criterion, and it should be substantially larger than 1,500,000 metric tons per year. Specifically, EPA should establish the volume criterion by determining the volume representing the 99th percentile of volume handled at regulated hazardous waste TSDs.

These commenters claimed that such an approach is supported by three considerations: (1) It makes data comparisons with those segments of the Subtitle C regulated community most relevant to the current rulemaking, therefore the results will not be arbitrary; (2) it reflects the technical feasibility of complying with subtitle C regulations, and therefore is consistent with EPA's original concept of the special waste exemption; and (3) by limiting the overlap between the regulated and exempt communities to one percent, it allows for unusual outliers while still narrowing the bounds of the exemption as Congress and the Court in *EDF II* intended.

These commenters went on to state that a volume criterion for liquids substantially greater than the proposed 50,000 metric tons per year is supported by data from the 1985 Biennial Report and other EPA data. They stated that the average non-commercial surface impoundment TSD owner/operator managed at least 922,000 metric tons of hazardous waste in surface impoundments during 1986, while the average non-commercial underground injection well facility managed at least 403,199 metric tons of hazardous waste

during 1986. Data on Alabama, Kentucky, Louisiana, South Carolina, and West Virginia indicate that waste was generated in quantities over several hundred thousand metric tons, generally on-site at the average State TSD.

EPA agrees with the commenters that currently available data on waste management at subtitle C facilities support a higher high volume criterion for liquids than for solids. However, the data from the Biennial Report were not adequate for the type of analysis EPA believed appropriate. To address these comments and to develop a specific cut-off value, the Agency used data from EPA's National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities (TSDR), which contains detailed information about volumes and specific types of wastes generated and managed at Subtitle C regulated facilities during calendar year 1986. These data allowed EPA to conduct a waste stream-level analysis of current management practices and hazardous waste volumes managed at facilities regulated under subtitle C of RCRA. Copies of the data used in the analysis are available in the docket.

As discussed more fully below, the Agency examined individual waste-code data for waste streams entering Subtitle C landfills to develop a revised criterion for solid/sludge materials, and for waste streams entering wastewater treatment processes, surface impoundments, and injection wells to develop a cut-off value for liquid waste streams. The final criterion values reflect the largest single waste code managed at the 95th percentile of the Subtitle C facilities employing these hazardous waste management techniques.

On the other side of the issue, several commenters stated that EPA's suggestion to use a separate high volume criterion for aqueous liquid wastes is inappropriate and that the Agency should apply the same high volume criterion to liquid and solid waste streams from mineral processing operations. They based this comment on the assertion that there is no justification for a separate aqueous waste criterion within RCRA, the Bevill Amendment, the Simpson Amendment, the legislative history, or the Agency's descriptions of the special waste concept. The commenters also contended that the disposal of aqueous wastes is already controlled for the most part under other programs such as the National Pollution Discharge Elimination System (NPDES) of the Clean Water Act and, therefore, a separate volume cut-off is not warranted. These commenters also

remarked that a higher liquid waste cut-off would cause many facilities to lose exclusionary status and be regulated under Subtitle C for solids as well as for wastewater.

The legislative history clearly identifies amenability to management under subtitle C as a primary criterion for defining special wastes. The Agency believes that, because liquid and solid wastes have very different characteristics and are managed with very different processes, defining a separate high volume cut-off for liquids and solids is appropriate and necessary to fully capture the differences in manageability of different types of waste streams. The fact that some waste streams may lose their excluded status is not a determining factor in establishing either the basis for or the specific values of a high volume criterion.

A commenter claimed that EPA should not include liquid waste streams in the basis of comparison for developing the high volume threshold value for solid wastes. This commenter also asserted that to determine the threshold value, EPA must compare the volumes and treatability of mineral processing wastes with the volumes and treatability of those wastes which are actually regulated pursuant to subtitle C.

EPA agrees. In today's rulemaking, EPA has proposed separate high volume criterion values for solid and liquid wastes that were derived through separate examination of newly available TSDR survey data on solid and liquid wastes currently managed under subtitle C.

A commenter suggested that application of different criteria to solid and liquid waste streams is unwarranted, because wastewater is commingled with both suspended and dissolved solids; these are not differentiated in the handling process.

The Agency disagrees, because the dissolved and suspended solids are not considered separate Bevill solid wastes unless and until they have been precipitated or otherwise separated from the wastewater and are managed as a distinct waste stream. Candidate Bevill wastes that are in liquid form at the time of generation will be compared to the threshold for liquid wastes and those that are in solid form will be compared to the threshold for solid wastes. A solid/sludge residual from a high volume liquid waste will retain Bevill status if it is high volume, i.e., passes the high volume test for solid materials.

Another commenter asserted that EPA's assumption that wastewater is

discharged from mining operations to waters under NPDES permits is incorrect in many cases. They maintained that the wastewater, which is commingled with solids, is evaporated. In addition, there is often no surface water in the vicinity of the mineral processing plants.

EPA has never made or articulated any assumptions about the final destination of wastewaters from mining and mineral processing operations and, in fact, asserts that the destination of treated wastewaters is irrelevant to the issue of determining Bevill status. A waste stream's Bevill status pertains only to how the waste is generated prior to disposal, not the manner in which it is finally disposed. The Agency is fully aware that wastewaters from mining and mineral processing operations are commonly evaporated or recycled after treatment.

One commenter asserted that EPA failed to understand that costs to manage wastewater escalate with impoundment size, thus regulation under subtitle C would burden facilities that manage wastewater in surface impoundments. For this reason, they maintained, EPA should use a less rigorous criterion than the 50,000 metric ton cutoff for liquid wastes.

While it may be true that the cost of waste management in surface impoundments increases in a non-linear fashion with the size of the impoundment, data from the TSDR survey indicate that facilities currently manage up to 44 million metric tons of a single hazardous waste stream in RCRA permitted surface impoundments, and that scores of facilities manage more than 50,000 metric tons of hazardous wastewater in surface impoundments annually. There are 55 facilities from the TSDR data set that managed over 1,000,000 metric tons of liquid hazardous waste in 1986. (A list of these facilities is contained in the docket to today's rule.) Many of these facilities use surface impoundments for one or more of their treatment processes. Across all facilities managing high volume hazardous waste, surface impoundments have been employed for virtually all treatment processes. These data demonstrate that management in surface impoundments under subtitle C regulations is feasible for volumes far greater than 50,000 metric tons.

Several comments specifically addressed EPA's suggestion of 1.5 million metric tons as a liquid waste cut-off. One commenter asserted that a 1.5 million metric ton threshold is arbitrary and inordinately high and suggested 250,000 metric tons as an alternative

value. Another commenter contended that EPA based its 1.5 million metric tons per year aqueous waste threshold on volumes of wastewater treated by other industries and that it is not certain that the mineral processing industry would produce the same volumes. Similarly, a commenter claimed that the 1.5 million metric ton threshold was based on unreasonable comparisons to wastewater streams that require little or no management. The proposed 1.5 million metric ton standard cannot be technically supported, they stated, because it was developed with reference to materials management practices that do not reflect the technical feasibility of applying Subtitle C controls to mineral processing wastes. Finally, one commenter contended that the total quantity of liquid waste streams routinely managed by industry is substantially lower than the proposed 1.5 million metric tons, therefore implementing this criterion would improperly exclude numerous aqueous waste streams from Bevill and the required study.

The Agency disagrees with the commenters on the importance of comparing mineral processing wastes only to identical wastes. The facilities in the TSDR data set represent a wide variety of industrial sectors and production processes, and generate a wide variety of waste streams. Waste streams examined in the analysis can in no way be construed to require "little or no management." Collectively, these facilities employ virtually all available waste management technologies, and commonly employ wastewater management techniques such as equalization, neutralization, metals precipitation, and coagulation/flocculation that are used to manage many, if not most, wastewater streams generated in the mineral processing industry. The docket document for today's rule referenced above also lists wastes generated and waste management technologies employed for 55 facilities managing high volume hazardous waste. Because these waste management technologies are generally available, virtually any wastewater management process employed by a facility in the TSDR data set could also be used by mineral processing facilities.

In its analysis of the TSDR data, however, EPA was sensitive to the concerns of these commenters about the similarity between mineral processing wastes and the subtitle C wastes being utilized to develop the high volume criterion. The similarity of waste streams examined, and therefore, the comparability of the two groups of

facilities, is demonstrated by the fact that, of facilities in the data set generating volumes of waste larger than the high volume threshold, several are actually mineral processing facilities and many others are owned and operated by companies that also own and manage mineral processing facilities.

3. Degree of Aggregation of Waste Streams

In keeping with the initial approach delineated in the October 20, 1988 NPRM, EPA stated, in the April 17, 1989 notice, its intention to apply the high volume criterion to individual waste streams. The Agency employed only limited aggregation of very similar wastes such as copper slags and certain process wastewaters.

Commenters in general requested more aggregation of waste streams before application of the high volume cutoff. Several commenters objected to EPA's position that high volume aggregate wastes managed at a single facility are not high volume at all, but rather a collection of low volume single waste streams. They stated that this position undermines the intent of Congress and impermissibly reduces the number of mineral processing wastes subject to further study. They also contended that nothing in the language of the Bevill Amendment or EDF II suggests that this is appropriate.

Another commenter asserted that EPA has artificially segregated processing wastes into specific waste streams for purposes of determining which wastes will remain within the Bevill exclusion. This failure to aggregate is particularly onerous, they claimed, in light of the Agency's tentative decision regarding how to apply the mixture rule.

Several commenters claimed that no evidence exists to indicate that aggregating individual process streams increases potential hazard. They noted that the accepted industry practice is to combine all waste streams in aggregate for disposal. By failing to consider waste streams in the aggregate, they asserted, EPA ignores real world management practices.

Another commenter noted that subtitle C data are based on the combined volumes of all hazardous wastes managed at individual subtitle C facilities rather than the volumes of individual waste streams. If EPA uses these data, they contended, then it must aggregate waste streams at mineral processing facilities as well. An additional commenter maintained that EPA has failed to recognize that slag is a universal term descriptive of metallurgical processing wastes from

many industry sectors. They claimed that, by specifically recognizing only wastes termed "slag," EPA has failed to afford continuing exclusion to other metallurgical process wastes that serve similar purposes.

These commenters suggested, instead, that EPA aggregate, for purposes of applying the high volume criterion, those waste streams from mineral processing which are similar in nature and subject to similar management practices. They maintained that both the legislative history and technical waste management feasibility considerations support this argument.

As it stated in the April 17 NPRM, the Agency largely disagrees with these commenters on the issue of the appropriate level of aggregation of waste streams. EPA believes, and the Court has agreed, that mineral processing wastes must meet the special waste criteria, namely high volume and low hazard, to be entitled to temporary exclusion from subtitle C requirements under the Bevill amendment. In order to complete the RCRA 8002(p) study requirements, EPA must define current and alternative management practices that could be employed to manage special mineral processing wastes. In practical terms, this requires that the Agency examine individual waste streams in order to determine whether current management practices are adequately protective of human health and the environment and whether individual Bevill wastes are amenable to Subtitle C controls. Moreover, because it is neither appropriate nor practical to apply the low hazard criteria to aggregated wastes, the Agency believes that it must address waste volumes as well as hazard on an individual waste stream basis.

Additionally, addressing mineral processing wastes on an individual waste stream basis is consistent with waste management regulations under the rest of the RCRA program. Under subtitle C, waste streams are listed individually and assigned waste codes. Each RCRA waste code represents an individual waste stream. Wastes in many industries, such as steel and petroleum production, are separated into several waste codes, each characterizing the individual process that generated them (see 40 CFR 261.31-33). These waste codes are treated individually under many of the subtitle C programs, such as the land disposal restrictions. In addition, requirements to determine whether a waste exhibits a hazardous characteristic contemplate an analysis on an "as generated" basis (see 40 CFR 262.11).

With respect to the commenter who asserted that EPA should aggregate mineral processing waste data because the data used to establish the volume criterion were aggregated, the subtitle C data used in support of today's rulemaking is sufficiently detailed to allow EPA to conduct a waste stream-level analysis of subtitle C waste management. Thus, there is no inconsistency in level of aggregation between the data used to develop the revised high volume criterion and the waste streams to which it has been and will be applied.

The Agency also received comments from representatives of individual mineral processing sectors about specific waste streams.

One commenter claimed that EPA's proposal to segregate waste streams into individual segments within a process is artificial and impractical. They maintained that this segregation would result in costly changes without significant environmental benefit. Because NPDES regulations require extensive recycling efforts and large holding ponds, it would be impractical to segregate waste streams. They asserted that the regulatory controls required by the proposed rule and by NPDES regulations would result in substantial conflict.

Another commenter stated that recirculated process water must be aggregated with phosphogypsum in making high volume determinations. Because water management at phosphate fertilizer plants uses an integrated system, they claimed, it is illogical and impractical not to aggregate phosphate process water for purposes of regulation. In addition, the waters recirculated throughout the phosphate rock processing facility are chemically similar at virtually every point.

The Agency finds these arguments unpersuasive. As discussed above and in the April 17 NPRM, it is most appropriate to consider wastes on an individual basis for the purpose of determining Bevill status. The fact that wastes are currently commingled at some point in the production irrelevant to this determination, as are site-specific permit requirements. Sector-specific waste management practices applied to Bevill mineral processing wastes will be evaluated for the Report to Congress.

A third commenter asserted that Congress considered phosphate processing wastes in the aggregate when it identified them as subject to the Bevill Amendment in the 1978 and 1979 documents, thus the Bevill Amendment requires aggregation of phosphate processing wastes. They maintained that management of aggregate waste

streams is essential to comply with environmental requirements and has not been undertaken to take advantage of the Bevill Amendment. They further claimed that, in its past studies, EPA also has recognized that phosphate process water must be evaluated on an aggregate basis. They concluded that considering phosphate processing streams on an individual basis will provide no meaningful protection of human health and the environment.

The Agency rejects the argument that one sector should receive special treatment for historical reasons. EPA believes that all commodity sectors and facilities should receive equal treatment in the determination of Bevill status. Moreover, as discussed at length in the October and April proposals, EPA believes that in a general sense, aggregation is inappropriate for considering both the volume of and hazard posed by mineral processing wastes. The Agency discerns nothing unique about phosphate rock processing that would justify differential treatment.

Other commenters asserted that the legislative history of the Bevill Amendment directs EPA to study all wastes from the mineral processing industry, including all metallurgical processing wastes whose fundamental purposes are the same. For this reason, they maintained, primary zinc iron residues should be aggregated and treated similarly to metallurgical residues from other nonferrous metal industry sectors. They appealed to EPA to consider that wastes from the various zinc processing operations may be identified by different names depending on whether the facility uses pyrometallurgical or hydrometallurgical techniques, and if hydrometallurgical, by the specific leaching process employed. They maintained that zinc processing residues which are essentially identical, including zinc lean slag, goethite, jarosite, hematite, and simply "iron residue," should be aggregated.

While the Agency understands the argument made by the commenter that the wastes mentioned are all impurities from the production of zinc, EPA has determined that the wastes arise from fundamentally different production processes (e.g., pyrometallurgical versus hydrometallurgical). It has, therefore, concluded that the wastes are not sufficiently similar to warrant aggregation. In addition, as discussed above, the Agency disagrees that the Bevill Amendment requires EPA to study all mineral processing wastes for the Report to Congress regardless of volume or hazard.

A commenter stated that sludge from beryllium ore leaching should remain within the Bevill exclusion. Prior to adding the sludge leaching step to enhance recovery of beryllium, materials now discarded as part of the low volume sludge leaching stream were discarded with the high volume barren filtrate stream. For this reason, they concluded, separating these waste streams for the purpose of determining high volume is inappropriate.

EPA disagrees with this argument. If the waste streams are separable, they are evaluated individually with respect to volume and hazard. The question of which other stream(s) might be comanaged with a given stream at any point in time is entirely irrelevant to these determinations.

4. Alternative Components/Application of the High Volume Criterion

In the April 17 NPRM, EPA proposed to apply the high volume criterion as the average annual facility generation rate across all facilities generating the waste streams in question.

Several commenters stated that the high volume criterion should allow exemptions for specific facilities generating over 50,000 metric tons of waste per year even if the industry average is less than the 50,000 metric ton threshold. One commenter contended that the Agency should recognize that meeting the 50,000 metric ton threshold would qualify a waste for study, not necessarily grant exclusion from subtitle C regulation. They also believed that using an average generation rate across a sector inaccurately represents the feasibility of real world management practices. The use of sector-wide averaging, they claimed, only serves to reduce EPA's burden and does not address the waste management problems faced by industry.

Another commenter asserted that EPA's rationale for changing the high volume criterion is illogical. They claimed that EPA's view that it is discriminatory to allow a facility which generates large volumes of waste to qualify for an exclusion is counter to the entire basis for the Bevill Amendment. The commenters also argued that EPA should not subject a facility to inappropriate requirements simply because some similar but smaller operations could not meet the Bevill criterion and could comply with subtitle C. They maintained that it would be much more discriminatory to impose the full panoply of subtitle C controls on a facility which cannot economically or technically comply with them. They further maintained that even the

flexibility allowed for large volume generators under RCRA 3004(x) would be lost under EPA's proposal.

The Agency finds this argument unpersuasive and, therefore, maintains that a sector-wide average facility generation rate is the most equitable way to define high volume mineral processing wastes. As stated in the April 17 NPRM, allowing any individual facility to qualify for the exclusion while requiring other, smaller facilities in the same sector to comply with subtitle C regulations would be unfair to the smaller facilities. Alternatively, excluding a waste stream on a sector-wide basis because of the large waste volumes generated by one facility might result in the retention within the exclusion of wastes that clearly are amenable to subtitle C controls at most facilities. As stated in the April NPRM, the Agency believes that the sector-wide average per facility generation rate represents the best alternative between these two extremes.

In the October 20, 1988 NPRM, the Agency solicited comment on the use of a second test for the high volume criterion; this test was based on industry sector-wide waste stream generation. This test was dropped for the April 17 NPRM.

Several commenters contended that EPA should retain the industry-wide criterion because it is a useful alternative for volume determinations. One commenter maintained that the Court of Appeals ordered EPA to draft criteria for Bevill wastes consistent with the Agency's historic definition of "special waste" and that the industry-wide criterion is an integral aspect of the Bevill mandate.

The Agency maintains that average waste generation per facility is a better indicator of the amenability of a waste to management under subtitle C than industry-wide waste generation. As noted in the April 17 NPRM, this belief is based largely on the fact that most large volume mineral processing wastes are managed on-site. EPA notes that the U.S. Bureau of Mines supports EPA's position on this issue. EPA also notes that the decision to eliminate this criterion affected only one waste stream of all those proposed in October or April or otherwise nominated (lime kiln dust). Lime kiln dust is generated by a calcining operation and, as discussed further below, is a beneficiation waste. Therefore, elimination of the criterion has no practical effect.

EPA also received comments on the idea of using a ratio of waste volume generated to quantity of final product as an additional or alternative volume criterion. This was an idea on which

EPA had solicited comments in the October 20 NPRM but which it decided not to employ in support of the revised high volume criterion published in the April 17 NPRM. Many commenters advocated using such a ratio instead of the average waste generation rate which EPA has used as the sole high volume criterion since the April 17 NPRM.

The Agency wishes to make clear the fact that it has never considered using a waste to product ratio as either a sole or alternative high volume criterion. At one time, EPA considered using a ratio in combination with the average generation rate as a high volume criterion. Following further analysis, EPA concluded that no added analytic power was provided by the ratio, because it has no relevance to the feasibility of managing a waste stream under subtitle C. For a full explanation of EPA's reasoning, refer to the April 17 NPRM (54 FR 15329). EPA has encountered no compelling arguments in any of the numerous comments on the October or April proposals that would support a change in the Agency's position with respect to the ratio concept.

Other comments addressed units of measurement. One commenter maintained that EPA should adjust its high volume criterion to take into account a waste's density. "High volume," they asserted, refers to the space a waste occupies, not its weight; the space a weight occupies is more relevant than its weight in determining its amenability to Subtitle C management.

EPA disagrees with this assertion and continues to believe that mass is the most relevant and workable indicator of the manageability of a waste stream. Because the physical space consumed by a material can vary over time based on the way in which it is handled (e.g., even "solid" materials can be compacted or undergo particle size reduction), EPA believes that mass is a more stable, and thus, more appropriate basis on which to develop and apply the high volume criterion. Additionally, mass is the most practical measure for evaluating waste quantities; virtually all other data on hazardous waste collected by EPA is measured in metric tons.

5. Type of Waste Used as the Basis of Comparison

In the April 17 NPRM, EPA based the high volume cut-off of 50,000 metric tons on volumes of waste generated and managed at Subtitle C regulated facilities. Congress intended the Bevill exclusion to cover only those waste streams that are generated in such quantities as to be potentially

unmanageable under subtitle C regulations. For this reason, the Agency feels strongly that comparison of mineral processing waste volumes with those of wastes managed under Subtitle C controls for the purpose of determining Bevill status is wholly appropriate and, in fact, the only appropriate analytical basis for developing the high volume criterion.

One commenter representing mineral processing industry interests maintained that the high volume criterion should be set at a level that reflects the proven technical feasibility of onsite disposal of similar wastes subject to Subtitle C regulation and that the threshold value should be based solely upon disaggregated waste streams.

The analysis undertaken by EPA in support of today's rulemaking reflects both of these concerns.

Several commenters objected to EPA's refusal to use the lowest of extraction and beneficiation waste generation rates to establish the high volume threshold, especially in light of the Agency's recognition that some extraction and beneficiation wastes are generated in volumes less than 50,000 metric tons per year. Another commenter maintained that refusal to use the lowest generation rate of the candidate Bevill wastes seemed in direct contrast with EPA's statement in the April NPRM that the generation rates of the six recently listed smelting wastes should serve as a lower bound for the high volume criterion because the six wastes are generally accepted as low volume wastes. An additional commenter asserted that EPA's selection of 50,000 metric tons per year as the high volume criterion based on comparison to generation rates of the extraction and beneficiation industry is arbitrary, without any factual basis, and improperly removes most mineral processing wastes from the study required in RCRA § 8002.

These comments represent a distortion of EPA's reasoning in the April 17 NPRM. At that time, the Agency asserted that wastes from extraction and beneficiation were typically generated in volumes orders of magnitude greater than most mineral processing wastes and therefore would be inappropriate to use as a lower bound for the volume cutoff. Subsequently, the Agency did not base the volume cutoff solely on generation rates of extraction and beneficiation wastes but used this information as a "reality check" for the volume threshold selected. The fact that only a small number of extraction and beneficiation wastes are below the cut-off does not

invalidate the concept, and in fact suggests that EPA's volume cut-off value is an appropriate measure of special waste status under real-world conditions.

One Commenter asserted that the fact that EPA received data on management of hazardous wastes biennially refutes the Agency's contention that it had to compare mineral processing wastes with aggregated subtitle C wastes because of insufficient information. They claimed that the 1985 survey (National Report of Hazardous Waste Generators and Transportation, Storage, and Disposal Facilities Regulated under RCRA) showed an average generation rate per waste of 12,467 tons per facility and suggested that this figure would be more appropriate as a basis for comparison.

The Agency agrees that a waste-by-waste evaluation is the best method for developing the high volume criterion, and has been able to use even more recent waste code-level data than that suggested by the commenter to develop the final criteria established by today's rule. The Agency disagrees, however, that the average generation rate is the appropriate value to use as the volume cutoff. As noted in the April 17 NPRM, the high volume criterion should exclude from subtitle C regulation only potentially unmanageable waste volumes, not average waste volumes.

EPA received several comments on the use of commercial subtitle C facilities as the basis of comparison. While several commenters stated that this is an inappropriate basis of comparison, other commenters supported the inclusion of commercial facilities in any data base addressing subtitle C waste management to be used as a basis of comparison.

Commenters favoring the use of commercial facilities objected to EPA's rationale that inclusion of data from commercial facilities is inappropriate because the incentives and costs/benefits from waste management differ for commercial facilities. They asserted that EPA's hazardous waste regulations apply to both commercial and non-commercial facilities; thus, the same incentives for compliance with regulations to avoid fines and/or imprisonment exist for all hazardous waste handlers. They also asserted that EPA has not demonstrated a fundamental difference in incentives for managing large volumes between commercial and non-commercial facilities. They maintained that, because commercial facilities must compete for clients, they do not have unlimited funds to comply with regulations. Finally, the commenters asserted that any difference in incentives does not address the

fundamental concern of the volume criterion which is the technical and institutional feasibility of complying with subtitle C requirements. Infeasibility, they added, should not be based upon a cost/benefit analysis which has no foundation in the statute or in the special wastes concept.

These commenters also asserted that data indicate that, in States containing a large number of TSDs, most TSDs are not commercial facilities. They added that TSDs that only manage waste on-site, manage the largest quantity of hazardous waste, indicating that the average quantity of hazardous waste managed per TSD is greater for non-commercial facilities than for commercial facilities. They concluded that these data disprove the theory that commercial facilities should be better able to manage substantial quantities of hazardous waste than on-site TSDs.

While EPA finds many of these arguments unpersuasive, particularly those addressing the economic incentives to operate commercial versus non-commercial subtitle C waste management facilities, the Agency does agree that technical feasibility is the fundamental issue addressed by the volume criterion, and has, accordingly, included commercial subtitle C facilities in the data base used to develop the revised high volume criterion described below.

6. Actual Threshold Value

In the April 17 NPRM, the Agency proposed 50,000 metric tons as the high volume cutoff. This value was to be applied to the average generation rate of each candidate waste stream. Comments on the actual value of the high volume cutoff were mixed, with some commenters arguing that the value was too low and others that it was too high.

Commenters arguing that the proposed value was too low presented evidence from several sources demonstrating that some regulated TSDs manage hazardous waste in volumes greater than 50,000 metric tons. They presented data from the 1985 National Biennial Report stating that in two of the ten EPA Regions, the average quantity of hazardous waste managed at each TSD substantially exceeded 50,000 metric tons per year. The commenters' analysis of these data also indicated that the top 50 and 100 generators of hazardous waste handle waste in quantities 78 times greater and 42 times greater, respectively, than the threshold quantity proposed by EPA.

The commenters also noted that of the nine listed hazardous waste streams EPA used for comparison to mineral

processing streams in the October proposal, four are generated in quantities larger than 50,000 metric tons per year. Additional data indicated that two-thirds of the nine largest waste streams currently regulated as hazardous are generated or managed in quantities exceeding 50,000 metric tons per year. Additionally, they claimed that EPA's proposed threshold quantity would exempt the average hazardous waste generator in at least three States.

Finally, the commenters maintained that the fact that 10 percent of the regulated community currently manages waste volumes larger than 50,000 metric tons indicates that the cut-off is too low. They further maintained that a 10 percent overlap between the regulated and unregulated communities is a broad overlap and does not reflect the Agency's assertion that the Bevill exclusion need not be broad.

All of these data, they asserted, indicate that the threshold proposed in the April NPRM is not indicative of technical or institutional infeasibility. They claimed that it could hardly be termed technically infeasible to manage 50,000 metric tons per year of hazardous waste if the average TSD manages quantities approaching or exceeding 50,000 metric tons per year in those parts of the country where large volumes of hazardous waste are managed.

While the Agency agrees with the basic premise of the commenters that available data support a higher high volume criterion (at least for liquid wastes), EPA disagrees with the commenters' particular use of data to support their claims. Specifically, the commenters selectively chose data from certain facilities, states, and regions to support their claims, casting doubt on the validity of their conclusions. EPA is not convinced that these selected data accurately portray current, representative hazardous waste management practices, and believes that presenting data from several selected states and regions in support of an argument is not sufficient evidence on which to base national policy. Additionally, the commenters used data that are aggregated across waste streams and, therefore, are not directly comparable to the analysis EPA has conducted. Finally, the Agency does not believe that a 10 percent overlap between Bevill wastes and the subtitle C universe is necessarily unreasonable.

Commenters asserting that the proposed value for the volume criterion was too high based their assertion primarily on three arguments: EPA arbitrarily selected 50,000 metric tons,

there should be at least a ten percent overlap between the Bevill exempt wastes and the subtitle C regulated community, and 50,000 metric tons is beyond the level of technical feasibility for wastes in solid form.

Several commenters stated that the Agency arbitrarily selected 50,000 metric tons per facility per year as a volume threshold and provided no justification for the selection of that value. A commenter also maintained that EPA should not use this very crude threshold value as a screen to perform a technical feasibility analysis for which it does not have sufficient information and support.

The volume criterion proposed in the April 17 NPRM was based on the best data EPA had available at the time and was therefore not arbitrary. However, since that time, better data have become available and have been used by the Agency in support of the volume criterion established by today's final rule, in part, to respond to these criticisms.

A commenter stated that there should be at least a ten percent overlap between the universe of Bevill processing wastes and subtitle C wastes and that the 50,000 metric ton threshold does not provide the necessary 10 percent overlap. EPA stated that the number of facilities that manage more than 50,000 mt/yr is "well under ten percent of the total," but the Agency failed to place into the administrative record data to support this claim. The commenter contended that the Agency, in failing to respond to comments raised on this issue in the October NPRM, has effectively denied the commenter an opportunity to comment fully on the proposed threshold.

The Agency does not accept the claim that data concerning subtitle C waste management and the development of the high volume criteria are not publicly available. The basis for development of the threshold is described in documents that may be found in the docket for the 10/20/88 NPRM. The issue is moot, however, because the Agency is today modifying the volume criterion based upon updated subtitle C waste management data, as described below.

Regarding the appropriateness of a ten percent overlap between the subtitle C wastes and the Bevill wastes, in the April 17 NPRM, EPA allowed a 10 percent overlap between subtitle C wastes and Bevill wastes to account for problems with the data used in the analysis. The Agency never intended to make the 10 percent overlap a rule for determining the high volume cutoff. The data used in the analysis in support of today's rulemaking are much stronger than those used before and thus the

Agency believes a five percent overlap is more appropriate and is supported by these more recent data.

One commenter maintained that, while the threshold value might be used for aqueous mineral processing wastes, technical feasibility requires a much lower threshold for solid mineral processing waste.

The Agency disagrees with this position. The TSDR data indicate that at least five facilities managing hazardous waste in solid form routinely manage 45,000 metric tons per year or more of a single waste stream; this represents roughly five percent of the facilities managing hazardous wastes in on-site subtitle C landfills.

Several commenters arguing that the proposed value is too high suggested lower values ranging from 10,000 metric tons per year to 30,000 metric tons per year. One commenter maintained that EPA should establish a facility average of no greater than 30,000 metric tons per year as this would only be slightly lower than three "acknowledged" Bevill wastes—zinc extraction wastes, utility FGD sludge, and utility bottom ash. Several other commenters stated that the rate should be lowered to a 10,000 metric tons per year facility average as this threshold indicates "high volume" compared to facilities producing wastes that are not classified as special wastes.

As EPA stated above and in the April 17 NPRM, the existence of a few Bevill waste streams with generation rates below the high volume cut-off does not invalidate the adopted threshold. The Agency is not obligated to select a high volume cut-off based on the three "acknowledged" Bevill wastes. As pointed out by a commenter on the April notice, volumes of utility wastes (and by extension, other Bevill wastes) may not be directly comparable to wastes from mineral processing. With respect to the suggestion of a 10,000 metric ton cutoff, EPA has not found support for such a low threshold in any relevant data available to the Agency when technical feasibility is considered as the basis for the determination.

Two commenters stated that EPA should develop a low volume, low hazard category. One commenter noted that many small processing operations are effectively managing wastes and may be significantly affected economically if subjected to subtitle C regulations. Another commenter asserted that there is no need to regulate aggregate or individual low volume/low hazard wastes under subtitle C; regulation under subtitle D would be more appropriate.

EPA disagrees. Congress clearly intended to exempt only high volume,

low hazard wastes under the Bevill Amendment. Those wastes which are not high volume may feasibly be managed under Subtitle C or Subtitle D as appropriate. Accordingly, EPA will not establish a separate regulatory category for low volume, low hazard mineral processing wastes.

One commenter claimed that EPA's statements regarding the high volume threshold are contradictory. They noted that EPA made the following statement in the November 1979 Draft Background Document: "due to the obvious interdependence of these criteria and the number of factors involved in assessing any particular criterion, quantification of the items is impossible." (Emphasis in comments only.) It follows, the commenter asserted, that the Agency's current approach in which a given waste stream generated at much less than 50,000 mt/yr, and which still poses manageability problems could be withdrawn from the Bevill exclusion based only on a quantified volume criterion, is absurd.

In 1979, EPA had little experience with the RCRA program, a limited understanding of the characteristics of the regulated community, and incomplete data on hazardous wastes and waste management. Since that time, EPA has dramatically improved each of these initial shortcomings and, thus, its ability to quantify and articulate the special waste criteria.

Finally, one commenter suggested that lowering the volume threshold would not pose any threat to the environment because no matter what the outcome of the section 8002(p) studies, the waste must be regulated either under subtitle C, the provisions of section 3004(x), or subtitle D.

While EPA believes that there is some merit to this argument, as discussed more fully below, the legislative history and direction from the Court dictate that only special wastes are eligible for exemption under Bevill and examination in the 8002 studies.

7. Application of the Cutoff Value to Waste Streams

Several commenters objected to the process of formulating national average volume determinations based only upon data submitted for one facility, arguing that it is arbitrary and capricious. These commenters also stated that EPA should verify all self-reported data submitted by the mineral processing companies because of the incentive for firms to inflate their waste generation rates and thus remain exempt. They asserted that EPA routinely discovers inaccurate self-reported data in other instances, even

when those data were submitted under oath.

EPA did not have the time or resources to measure candidate waste streams at affected facilities. In addition, EPA had a very limited amount of time in which to collect the additional data needed to fully determine the Bevill status of each candidate waste stream. In order to propose the regulatory status of several waste streams and provide appropriate opportunity for notice and public comment in accordance with EPA's Court-imposed schedule, the Agency had to rely on self-reported volume data. The self-reported data will be verified by examination of new data from the National Survey of Solid Wastes from Mineral Processing Facilities. Waste streams that the survey data indicate do not meet the high volume criterion will be proposed for removal in the September 15, 1989 proposed rule addressing the status of wastes that have been conditionally retained within the exclusion. Facility operators completing the mineral processing survey are subject to section 3007 penalties for submission of false data.

Several commenters objected to EPA's proposed use of the highest average generation rate over a five year period (1983-1988) as the value for comparison with the volume criterion. Several commenters expressed concern that this would ignore the possibility that waste generation across the years has been reduced due to improved waste management processes. They felt that EPA should not ignore substantial waste reduction trends, when the existence of those trends could remove the eligibility of the waste from the Bevill exclusion. These commenters suggested, instead, that EPA base volume determinations upon the lower of either the average generation quantity from 1982-87 or the average generation quantity for calendar year 1987. This method, they asserted, would allow EPA to take into account both waste reduction trends and variations in market conditions.

Congress intended to exclude only those wastes that are generated in volumes that are potentially unmanageable under Subtitle C. The Agency believes that the highest average generation rate for any year between 1983 and 1988 is a better indicator of potential difficulty in managing a waste under Subtitle C than the method proposed by the commenter because it allows for changes in waste generation rates caused by fluctuations in commodity markets. The method suggested by the commenter is arbitrary and would punish sectors that might

have had low waste generation rates in any single year during the most recent five year time period due to poor economic conditions rather than waste minimization efforts as implied by the commenter.

Between the October 20, 1988 NPRM and the April 17, 1989 NPRM, EPA shifted the five year period for which EPA will consider waste generation rates from 1982-1987 to 1983-1988 so that it could base its decision on the most recently available data. Several commenters expressed concern that the shift in the "window" will allow new waste streams to become eligible for inclusion into the Bevill exclusion. They maintained that the Agency should not allow further opportunities for waste generators to provide new data.

The Agency maintains that, in the interest of treating all affected firms equally, any mineral processing wastes that meet the definition of a special waste should be included in the Report to Congress, even if the key information about that waste stream came from 1988.

The Agency rejects the argument of one commenter that EPA should use production data from all facilities producing chrome processing wastes in any year during the period 1983 through 1988, irrespective of whether any such facility is still operating. Because the Agency does not impose requirements retroactively, it would be inappropriate to use past data from facilities that are no longer in operation to develop regulations. Therefore, exclusion from Subtitle C regulation under the Bevill Amendment will be based only on waste volumes generated at active facilities. For additional detail on the EPA's policy not to impose regulatory requirements retroactively, see section II of this preamble.

D. The Definition of Mineral Processing

In the preamble to the October 20, 1988 proposed rule and again in revised form in the April 17, 1989 NPRM, EPA provided criteria for defining and identifying wastes from ore and mineral processing operations. These criteria require that all wastes qualifying for exclusion under the Bevill Amendment originate from a mineral processing operation as defined by the following elements:

- (1) Excluded Bevill wastes must be solid wastes as defined by EPA.
- (2) Excluded solid wastes must be uniquely associated with mineral industry operations.
- (3) Excluded solid wastes must originate from mineral processing operations that possess all of the following attributes:

- a. Follow beneficiation of an ore or mineral (if applicable);
 - b. Serve to remove the desired product from an ore or mineral, or from a beneficiated ore or mineral, or enhance the characteristics of ores or minerals, or beneficiated ores or minerals;
 - c. Use mineral-value feedstocks that are comprised of less than 50 percent scrap materials;
 - d. Produce either a final mineral product or an intermediate to the final product; and
 - e. Do not combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying), do not involve fabrication or other manufacturing activities, and do not involve further processing of a marketable product of mineral processing.
- (4) Residuals from treatment of excluded mineral processing wastes must be historically or presently generated and must meet the high volume and low hazard criteria in order to retain excluded status.

1. Excluded Bevill Wastes Must be Solid Wastes as Defined by EPA

EPA proposed in the October NPRM and confirmed in the April NPRM that it will use the definition of solid waste codified at 40 CFR 261.2 to identify materials that are eligible for consideration as special wastes, stating that nothing in the regulatory history of the Bevill Amendment indicates that the Agency is expected to or should apply a definition of solid waste that is different than that applied throughout the RCRA program.

EPA received a number of comments relating to the issue of when and if the materials under consideration in this rulemaking can be RCRA "solid wastes" when they are destined for recycling. These comments were of three types. Most dealt broadly with the overall question of the Agency's authority to classify materials destined for recycling as solid wastes. A few comments were more specific, mentioning types of materials involved. Finally, another group of comments dealt in detail with types of materials (principally iron and steel slag) that are recycled.

Before responding to these comments, the Agency first notes that this issue is without direct effect on persons managing materials that EPA has determined remain Bevill wastes because they satisfy the high volume/low hazard criteria. EPA will consider such materials further as part of the section 8002 study, but there are no regulatory consequences on persons

managing such materials. (EPA notes further that it is directed to study the "utiliz[ation]" of mining wastes, indicating some expectation that examination of recycling practices would be part of the Bevill study. RCRA section 8002(p).)

There may be regulatory consequences for materials that the Agency determines were improperly classified under previous interpretations of the Bevill amendment. Such materials are analogous to other wastes newly brought into the subtitle C framework, and thus become subject to all of the subtitle C regulations. If such materials are "solid wastes", then they also can be hazardous wastes subject to applicable subtitle C standards. Comments on this point failed to identify specific types of materials affected, however, and so failed to provide any indication of whether there are any elements of discard associated with the recycling activities (such as land based storage, prolonged retention times, management in unrelated facilities, presence of high concentrations of unrecyclable toxic constituents not found in virgin materials that would be processed in place of the secondary materials, and other similar elements). It is EPA's belief, based on prior rulemakings dealing with recycling, that most of the materials newly classified as non-Bevill materials would not be solid wastes when recycled in metal recovery operations because they would be unlisted sludges and byproducts being reclaimed. Such materials are not classified as solid wastes (§ 261.2 (c)(3)), unless they are being speculatively accumulated. Thus, today's rule would not have any practical impact on such materials.

EPA's responses to the commenters' specific points are set out below.

a. With respect to the Agency's authority to regulate types of recycling as hazardous waste management, EPA has indicated many times its views on the extent of its authority. See particularly 50 FR 638 (Jan. 4, 1985) and 53 FR 519 (Jan. 8, 1988). EPA does not subscribe to the view that only things that are thrown away are solid wastes. Such a reading nullifies explicit statutory authorities (see RCRA sections 3004(l), 3004(q), and 3014), and fails to take into account that many recycling practices are characterized by elements of discarding which afford jurisdiction under RCRA Subtitle C. The Agency also does not believe that anything in *American Mining Congress v. EPA*, 824 F. 2d 1177 (D.C. Cir. 1987) is to the contrary. Certainly, nothing in the

opinion indicates that the Court intended to make legal such practices as the road oiling at Times Beach, Missouri, or unrestricted burning of hazardous secondary materials in boilers and industrial furnaces. Yet this is the direct consequence of the commenters' position. However, as noted above, this issue appears to be only an academic one in this rulemaking, given the lack of practical consequences.

EPA also notes that, contrary to the view of several of the commenters, it is not finalizing the January 8, 1988 definition of solid waste in this proceeding. EPA is indicating that a material need not be thrown away to be a solid waste, and that recycling activities can be characterized by elements of discarding. This has been EPA's articulated position since the first major RCRA subtitle rules were issued on May 19, 1980. 45 FR 33090-94. Had commenters provided more detailed information, EPA could provide more guidance as to the status of particular materials. Given the absence of such comment (with a few exceptions discussed below), EPA can only articulate broader principles here.

b. Some commenters were slightly more specific about the types of materials being recycled that should not be considered to be RCRA solid wastes. One stated that "intermediates and inprocess materials" such as copper matte, blister copper, lead bullion, lead drosses, and various "secondary materials" such as flue dust and wastewater treatment sludges, should not be considered to be solid wastes when they are processed to recover metal values. The specific type of recycling referred to in this comment is reclamation. Existing regulations (see 40 CFR 261.2(c)(3)) state that sludges and by-products such as those discussed in the comment, are solid wastes only if they meet one of the hazardous waste listing descriptions found at 40 CFR 261.1 or 261.32. When wastes from specific or non-specific sources are listed as hazardous, i.e., are included in 40 CFR 261.31 or 261.32, existing waste management practices, including recycling, are considered in establishing the precise wording of the listing. Today's rulemaking would not, however, add new listings to either 40 CFR 261.31 or 261.32, and would therefore not affect whether materials discussed in the comment, assuming that they are being legitimately recycled, would meet the definition of a solid waste. EPA has previously indicated that surface impoundments used for wastewater treatment are not part of recycling operations. See, e.g., 53 FR 35414-5 (lead

impoundment solids). Such units are generally intended for purposes of waste treatment and are thus normally subject to regulation as waste management units.

c. A number of commenters stated that iron blast furnace slag and basic oxygen furnace slag should not be considered to be solid wastes when they are utilized as aggregate substitutes. EPA notes first that it views these materials as remaining within the scope of the Bevill exemption, so there is no immediate regulatory consequence of calling these materials solid wastes. However, EPA is not making a final determination on the issue of whether these materials are solid wastes. EPA will study this issue further as part of the section 8002 study. Commenters indicated that even though these slags are recycled in ways that involve application to the land (whether directly or in the form of slag-derived products like cement and concrete), the slags have been used for decades interchangeably with high-grade natural aggregates, they meet all relevant commercial specifications for aggregate, there is a known and profitable market for all of the slag generated by industry (indeed, some blast furnace slag is imported to meet domestic demand), and the slag appears impervious to leaching toxic metals under the EP toxicity test. EPA has requested further information comparing these blast furnace slags to virgin aggregates to ascertain whether unrecyclable toxics might possibly be being disposed by the recycling practice. The Agency is impressed by the public comments, however, and may ultimately determine that these slags are not solid wastes. Certainly, based on the public comments, these slags appear now to be a long-standing part of the commercial aggregate market, and are commonly accepted as meeting all relevant commercial specifications.

A second commenter indicated that recirculating process water is not a waste. Although the commenter did not describe precise details of operation, the Agency agrees that normally continued use of process water in an industrial process does not involve wastewater but rather continued use of process water. This answer assumes, however, that wastewater is not removed from the system to be reclaimed before it can be reutilized. In the event that this process water is managed outside of a closed-loop recycling system, such as in a surface impoundment for cooling or settling, then the impoundment would likely be considered a waste

management unit and subject to EPA's jurisdiction, as discussed above.

2. Excluded Solid Wastes Must Be Uniquely Associated With Mineral Industry Operations

To be excluded under the Bevill Amendment, solid wastes must be uniquely associated with the mineral processing industry. EPA received no significant comments either in support of or in opposition to this criterion, and will continue to require that wastes meet this criterion.

3. Excluded Solid Wastes Must Originate From Mineral Processing Operations as Defined by Five Specific Criteria

In general, commenters believed that the attributes used in the proposed rule to define mineral processing were acceptable. As discussed in the Appeals Court decision that precipitated the current rulemaking, EPA is obliged to consider whether candidate wastes are high volume and low hazard in making Bevill mineral processing waste exclusion decisions. While these factors are, and have always been, the key elements in identifying special wastes, the distinction between mineral processing and nonmineral processing wastes is important because Congress intended to put within the regulatory exclusion only wastes generated as a consequence of exploiting a natural resource, not wastes from other industrial activities, even if both occur at the same facility.

a. *Operation must follow beneficiation of an ore or mineral (if applicable). Processes that use heat to change the chemical composition of ores and minerals, or beneficiated ores or minerals, are considered mineral processing operations. Heap, dump, and in-situ leaching, as well as tank and vat leaching, are specifically defined as beneficiation operations.* Commenters addressing the October, 1988 NPRM's beneficiation definition argued that it did not adequately delineate the boundary between beneficiation and processing. The U.S. Bureau of Mines (BOM) commented extensively, claiming that the October definition did not adequately express EPA's intent that leaching be considered a beneficiation operation. Therefore, in the April, 1989 NPRM, EPA modified the proposed rule (1) to define heap, dump, in-situ, tank, and vat leaching as beneficiation, unless they follow one or more processing operations in the production sequence, in which case they are considered processing operations; and (2) to clarify that processing operations use chemical reactions, electrolytic techniques, or

pyrometallurgical/thermal processes (e.g., roasting, smelting, calcining) to concentrate or enhance the characteristics of valuable constituents and, thus, differ from beneficiation operations (some beneficiation operations employ heat, but only to remove water).

Industry commenters addressing the April NPRM criticized EPA for, in effect, narrowing the definition of beneficiation, claiming that the Agency focused too strongly on chemical and physical distinctions when it clarified the beneficiation definition. By classifying steps such as roasting as mineral processing and steps involving drying as beneficiation, the Agency's definition, they claimed, would result in some previously excluded beneficiation wastes now being considered "processing" wastes potentially subject to Subtitle C regulation. They complained that EPA has offered no explanation for why it has apparently decided to eschew previous definitions of beneficiation. They contended that the shift could cause precious metals industries in the United States to suffer drastic and unwarranted economic impacts. Commenters insisted that the Agency address the problems caused by its "clarification" of beneficiation and processing and suggested the alternatives below.

i. *Use the Report to Congress Definition of Beneficiation.* Many commenters recommended that the Agency abandon the restrictive list of beneficiation operations in the NPRM and adopt the definition of beneficiation found in the 1985 Report to Congress. These commenters maintained that this definition historically has been accepted by the mining industry, adopted by EPA, subjected to Congressional scrutiny, has withstood litigation in EDF I, and can be traced back to an even earlier definition found in the EPA effluent limitations guidelines development document on ore mining and dressing. The commenters claimed that any attempt by EPA to contradict the Report to Congress and its Regulatory Determination is barred both as a matter of administrative law and by Congress' decision that beneficiation wastes may not be regulated as hazardous without an additional Report to Congress and Regulatory Determination.

ii. *Eliminate or Modify the Heat Criterion.* Many commenters suggested that EPA eliminate or modify the heat criterion added as a part of the clarification in the April, 1989 NPRM. Commenters stated that the Agency's addition of the "heating" of ore criterion redraws the line between beneficiation

and processing without adequate analysis of the impact of such revision, or support in the Bevill Amendment or the legislative or regulatory history. They argued that using heat as a criterion improperly includes beneficiation operations within mineral processing. They claimed that production activities used in the beneficiation and extraction of gold demonstrate that certain pretreatment steps are necessary to prepare ore for leaching, and insisted that EPA not categorize any pretreatment steps as processing regardless of whether they involve heat treatment. Many commenters, in discussing using heat as a criterion, addressed calcining, roasting, and leaching operations that use thermal pretreatment (i.e., autoclaving, roasting, and chlorination). These comments are summarized below.

Roasting of ore, commenters contended, is incorrectly considered a mineral processing operation rather than beneficiation in the NPRM. They contended that roasting does not fit any of the other four processing attributes detailed in the rule; roasting does not remove desired product from an ore or mineral, does not use feedstock comprised of less than fifty percent scrap, and does not produce either a final product or an intermediate to the final product, and does not involve manufacturing, alloying, etc. They noted that under the proposed definition, any operation that follows roasting or autoclaving is considered mineral processing; leaching, however, is specifically defined as a beneficiation operation, and EPA should not separate out leaching operations that involve thermal treatment.

Regarding leaching operations, commenters, especially those in or representing the precious metals sectors (e.g., gold, silver), and the Bureau of Mines agreed with EPA that beneficiation should include physical/chemical separation techniques such as heap, dump, tank, vat, and in-situ leaching.¹ The commenters, however, argued that the use of heat as a pretreatment for the leaching operation should not automatically render an operation as processing, noting that ores and minerals which are roasted,

¹ EPA's policy toward leaching, as stated in a previous regulatory determination [see Regulatory Determination for Wastes From the Extraction and Beneficiation of Ores and Minerals, 51 FR 24496 (July 3, 1986)] is that active leach piles and leach solutions are not wastes, but rather are raw materials used in the production process and intermediate products, respectively. Only leach solutions that escape from the production process are considered wastes while the leaching operation is active.

autoclaved, or chlorinated are no less earthen than is raw ore, and their volume remains relatively unchanged. They noted that if finalized, the April, 1989 NPRM could subject tailings or spent ore from many leaching operations to subtitle C regulation, even though the Regulatory Determination of July 3, 1986 stated that these wastes did not require such regulation. Commenters claimed that, because the near surface precious metals deposits are being depleted, the future of the industry lies in the deeper sulfide zones that produce ores requiring some pretreatment (i.e., roasting, autoclaving, and chlorinating) to effectively yield their metal values. The Agency must consider, they argued, the extremely onerous operational consequences (e.g., requiring parallel waste units for identical waste streams) and economic consequences (e.g., putting small or marginal mines out of business) that would result from maintaining the processing definition in the most recent proposal; this definition would, concurrently, yield no significant environmental benefits. Therefore, the commenters requested that EPA clarify that wastes from leaching operations that pretreat will remain beneficiation wastes excluded from Subtitle C. Alternatively, they noted, if EPA retains the definition given in the April notice, the Agency will be required to restudy gold leaching wastes (gold roaster/leach wastes would not differ significantly from the leached ores studied previously by EPA in the 1985 Report to Congress) since they would meet the high volume criterion.

Calcining, the heating of ores to high temperature without fusion of the mineral values (generally to drive off volatile components such as water and carbon dioxide), also received extensive comment from commenters who were concerned that EPA considered calcining to be processing. These commenters suggested that EPA should limit its clarification of beneficiation to exclude only those heating operations where the calcining gases effect a chemical change that will facilitate smelting. Representatives of the western phosphate processors, in particular, attacked the inclusion of calcining in processing, claiming that the sizing, drying, agglomeration, and concentration functions of calcining—which do not chemically alter the phosphate nor remove valuable constituents—meet EPA's definition of beneficiation and that the classification of phosphate rock calcining or drying and nodulizing/heating operations as beneficiation has long been the subject of agreement between EPA and the

phosphate processors. The phosphorus industry stated that calcining is analogous to the calcining employed by diatomaceous earth producers which is regulated under subtitle D and argued that a supportable distinction can be made between metallurgical calcining and those heating operations found in the diatomaceous earth and phosphorus industries.

iii. *Make Other Modifications to the Beneficiation Definition.* As an alternative to using the RTC definition, industry commenters recommended several modifications to the definition of beneficiation.

- EPA should view beneficiation collectively and functionally, define beneficiation as activities, both physical or chemical, by which ores and minerals are prepared for further refinement. An operation which precedes beneficiation and/or conditions or prepares an ore or mineral so as to make it more amenable to beneficiation, should also be considered to be part of the beneficiation operation, regardless of whether the operation employs physical or chemical techniques. Removing impurities and improving quality is a purpose of beneficiation and coincides with the generally accepted technical usage of beneficiation.

- EPA should clarify that wastes from beneficiation operations that follow a processing step should be considered beneficiation wastes. Therefore, the Agency should state that any steps performed after beneficiation ends are processing operations and that processing would begin with the last beneficiation activity, not with the first processing activity. This clarification would draw a clear boundary between beneficiation and processing that would reflect "real world" operations better than the definition provided in the April 17, 1989 NPRM.

- If the Agency seeks to control specific beneficiation waste streams, it should use the Subtitle C "listing" mechanism as opposed to redefining beneficiation.

iv. *Specify Certain Activities as Beneficiation.* In addition to roasting, autoclaving, calcining, and leaching, many commenters addressed specific operations, recommending that EPA clarify that certain activities are beneficiation operations. Collectively, these commenters suggested that EPA adopt a definition of beneficiation that includes physical/chemical separation processes such as crushing, grinding, gravity concentration, magnetic and electrostatic separation, flotation, precipitation, amalgamation, ion exchange, solvent extraction,

electrowinning, dissolution, chlorination, and agglomeration.

The following recommendations were made by commenters regarding specific operations.

- Electrowinning should be considered beneficiation and be retained under the Bevill exclusion. The April, 1989 NPRM states that electrolytic and other chemical techniques are processing, not beneficiation, directly and inappropriately contradicting prior EPA pronouncements and regulatory action on the scope of the beneficiation exemption.

- The carbon regeneration process in which activated carbon granules adsorb gold from solution should be considered beneficiation, as these activities conclude the leaching process, and therefore constitute beneficiation.

- The Agency should specifically include dissolution in the list of beneficiation operations. For example, trona wastes produced from the "Sesqui" process are beneficiation wastes, because the dissolving and calcining operations associated with the "Sesqui" process only remove insoluble tailings wastes and drive off excess water and carbon dioxide.

- EPA should clarify its definition of beneficiation by specifically identifying "filtration" and "physical separation" as sorting to be included as part of beneficiation.

- The Agency should continue to include agglomeration as beneficiation and not limit this term to sintering because it includes other processes besides sintering, such as pelletizing and briquetting.

- EPA should define the chlorination procedure, used on some carbonaceous ores prior to leaching, as a beneficiation operation, not as processing. The chlorination procedure uses an oxidizing agent to change the chemical composition of the ore and to enhance the leaching operation.

- EPA should state that the "chloride-ilmenite" process used for titanium dioxide processing is a simultaneous ore beneficiation and chlorination process in which beneficiation and chlorination of raw ilmenite ore are inseparably combined in the same process step. EPA should confirm its previous positions that these wastes are generated from a beneficiation process.

After review of the public comments and further analysis, the Agency has concluded that, both functionally and legally, the most appropriate definition of beneficiation for use in distinguishing between beneficiation and processing is the definition used in the December, 1985 Report to Congress (RTC) on

wastes from extraction and beneficiation of ores and minerals. This definition was, in turn, based upon a definition provided in the Effluent Guidelines Development Document. EPA believes that this definition is consistent with standard industry practice and use of the term. The RTC defines beneficiation as "the treatment of ore to concentrate its valuable constituents."² While the RTC did not attempt to articulate a comprehensive list of beneficiation operations, procedures or techniques, it did expound on the definition by describing beneficiation processes as including

Physical/chemical separation techniques such as gravity concentration, magnetic separation, electrostatic separation, flotation, ion exchange, solvent extraction, electrowinning, precipitation, and amalgamation."³

In addition, the RTC explicitly includes leaching operations as an integral part of the extraction and beneficiation domain and labels the leachate as a "beneficiation solution."⁴

While this definition serves well as a foundation for making a distinction between beneficiation and mineral processing, the list in the RTC is not an all-inclusive list of beneficiation processes and several points of clarification are necessary regarding application of this RTC definition to real-life operations. For example, the RTC list does not include milling techniques such as crushing, grinding, washing, filtration, sorting, and sizing, or agglomeration techniques such as sintering, pelletizing, and briquetting that both industry and EPA consider to be beneficiation operations. In order to avoid further confusion, the Agency wishes at this time to identify other activities that it considers to be within the realm of beneficiation, and in particular to discuss the status of activities using heat and acid.

EPA notes here that the definitions that it has developed for today's rule represent an attempt to resolve the issues raised in public comment on the proposed rules in a reasonable and even-handed manner. The Agency recognizes that its course is not the only one available, but does believe that it provides the most equitable and workable approach to a very complicated set of issues. Furthermore, while EPA has attempted to develop consistent and reasonable definitions

for and distinctions between beneficiation and processing, the Agency believes that application of these definitions must comport with common sense. In cases where a rigid application of a definition would result in an unreasonable outcome, the Agency has used best professional judgment to produce an acceptable result.

Heating steps recognized by EPA as beneficiation operations are calcining, and roasting and autoclaving of ores and minerals in preparation for leaching. All three are procedures that use heat to drive off volatiles (e.g., water, carbon dioxide, sulfur dioxide) without heating the material above the mineral's melting point and/or causing fusion (i.e., liquefying or rendering plastic by heat⁵). Operations that raise the temperature of the ores or minerals, or beneficiated ores or minerals, above their fusion or melting point, i.e., destroy the physical structure of the ore or mineral, are considered processing operations.

Calcining is often used to drive off carbon dioxide in the preparation of a final beneficiated product (e.g., talc, gypsum, lime), and for purposes of this rule is defined as the heating of an ore or mineral, or beneficiated ore or mineral to a temperature below the melting or fusion point, for purposes of driving off water (including waters of hydration) and/or carbon dioxide.

In the minerals industry, roasting serves primarily to change a sulfide ore to the oxide form, so that beneficiation by leaching or other subsequent steps may be more effectively performed. Functionally similar to roasting, autoclaving uses steam to perform heating activities (e.g., pretreating sulfide ore for leaching). For purposes of this rule, roasting and autoclaving are considered beneficiation operations if they are used to remove sulfur and/or other impurities in preparing an ore or mineral, or beneficiated ore or mineral, for leaching. Otherwise, roasting and autoclaving are defined as processing operations. Accordingly, activities such as roasting sulfide ores in preparation for precious metals heap leaching are considered beneficiation, while roasting ores or concentrates in preparation for copper, lead, or zinc smelting is specifically defined as processing.

Chlorination is sometimes used prior to gold leaching operations in a procedure functionally identical to roasting and autoclaving (i.e. to change a sulfide ore to a chemical form more amenable to leaching). EPA recognizes

that this type of pretreatment operation may be an integral part of leaching operations, and accordingly, considers non-destructive chlorination of ores, minerals, or beneficiated ores or minerals when used as a pretreatment step for leaching, to be a beneficiation operation.

In contrast, heating operations such as smelting (i.e., any metallurgical operation in which metal is separated by fusion from impurities⁶) and fire-refining (e.g., retorting) are clearly and have always been considered within the realm of mineral processing. Here, the physical structure of the ore or mineral is destroyed, and neither the product stream nor the waste stream(s) arising from the operation bear any close physical/chemical resemblance to the ore or mineral entering the operation.

A specific exception to the above categorization system applies when the roasting/leaching sequence produces a final or intermediate product that does not undergo further beneficiation or processing steps (e.g., the leach liquor serves as an input to inorganic chemical manufacturing). In this type of situation, the Agency believes that the operation is most appropriately considered a processing, rather than a beneficiation, operation. In the context of this rulemaking, one candidate Bevill waste (roast/leach ore residue from primary chrome ore processing) is affected by this distinction; EPA believes that this material is clearly a waste from processing, rather than beneficiation, of an ore or mineral.

Several additional operations employ heat in combination with various acids. In EPA's view, some of these operations constitute beneficiation while others are processing. The distinction hinges upon the difference between dissolving, washing, or otherwise purifying values contained within a mineral using a dilute acid solution (beneficiation) and attacking or digesting (i.e., destroying the structure of) the ore or mineral, or beneficiated ore or mineral, using a strong acid (processing). Acid dissolution, often accompanied by heat, is used as precursor for many beneficiation operations (e.g., precipitation, fractional crystallization, ion exchange, solvent extraction). EPA recognizes this as an activity integral to many beneficiation operations, regardless of the application of heat or use of acid. For example, EPA recognizes acid washing and acid dissolution as beneficiation activities; concentrated sulfuric acid attack of titanium- or phosphate-bearing ores is

² Ibid., D-1.

³ Report to Congress on Wastes from Extraction and Beneficiation of Metallic Ores, Phosphate Rock, Asbestos, Overburden from Uranium Mining, and Oil Shale, pg 2-15.

⁴ Ibid., 2-18, D-4.

⁵ U.S. Bureau of Mines. "A Dictionary of Mining, Mineral, and Related Terms". Washington, DC: 1972, p. 473.

⁶ Ibid., pg 1033.

considered a processing operation by the Agency.

In considering the functional distinctions between beneficiation and processing using both heat and acid, EPA has examined both the range of actual practices employed, and the types of waste streams that are generated by these operations in various mineral commodity sectors. In a general sense, the lines that the Agency has drawn between beneficiation and processing parallel the common sense differences that can be observed between beneficiation and processing wastes generated using other types of mineral exploitation techniques. Most beneficiation processes, at least those immediately upstream from the initial processing operation in a production sequence, generate high volume solid waste streams that are essentially earthen in character. Despite the fact that valuable constituents have been removed, the remaining material is often physically and chemically similar to the material (ore or mineral) that entered the operation, except that particle size reduction has often occurred. Processing operations, in contrast, generate waste streams that generally bear little or no resemblance to the materials that entered the operation (with the arguable exception of smelting slags). These operations most often destroy the physical structure of the mineral, producing product and waste streams that are not earthen in character.

This common sense distinction is reflected in EPA's definitions of beneficiation and processing operations using heat and acid. The beneficiation operations (e.g., calcining, dissolution, roasting in preparation for leaching) produce wastes, where applicable, that are essentially earthen and of relatively high volume. The processing operations (e.g., smelting, acid or alkaline digestion), on the other hand, produce wastes that are not earthen, bear little resemblance to the materials that entered the operation, and are of relatively lower volume.

One final beneficiation/processing issue is the need for an absolute cut-off between processing and beneficiation, a need that was questioned by commenters. EPA continues to hold that beneficiation, especially as a functional activity which serves to concentrate the mineral value, is completed at some distinct point after which all operations are considered processing. As discussed in the April NPRM, the Agency considers any operations following the initial processing operation to be processing operations, regardless of whether the activity was included on the

list of RTC beneficiation activities or has traditionally been considered beneficiation. For example, electrolytic refining, an operation often used after smelting and/or fire refining, uses procedures similar to activities listed in the RTC definition (e.g., electrowinning) or considered historically to be beneficiation (e.g., dissolution). Because, however, the operations follow previous processing operations, these activities will be considered processing and any associated wastes will be considered mineral processing wastes.

EPA acknowledges that the decision to use this beneficiation definition is a significant departure from the position taken in the October and April NPRMs, particularly with respect to the use of heat and acid. After analysis of public comments, further review of technical information regarding mineral beneficiation and processing techniques, and reexamination of the 1985 Report to Congress and 1986 Regulatory Determination, the Agency has concluded that this definition will render the most accurate, practical, and reasonable delineation between beneficiation and processing. Furthermore, the Agency expects that little environmental benefit would be gained by including these additional operation types within "mineral processing" because the Agency believes that the wastes from these operations are relatively few in number, have in a number of instances already been studied, and will in any case be addressed by the Subtitle D regulations for extraction and beneficiation wastes presently under development by the Agency.

b. *Operation must serve to remove the desired product from, or enhance the characteristics of, an ore or mineral, or a beneficiated ore or mineral.*

Commenters addressing this attribute in the October 20, 1988 NPRM indicated that the language (i.e., to remove the desired product from an ore or mineral or beneficiated ore or mineral) obscured the regulatory status of certain processing operations (e.g., lightweight aggregate production) whose purpose is to change the characteristics of valuable constituents in ores or minerals without removing or concentrating them. They suggested, and EPA agreed, that the processing definition be modified to include operations that serve to enhance the desirable properties of, as well as those that remove the desired product from, an ore or mineral. EPA modified the second attribute of mineral processing to include production steps that use heat to alter the chemical composition of ores or minerals, or

beneficiated ores or minerals. Many commenters addressing the April NPRM argued vehemently that EPA should not include all operations which use heat for operations other than drying in the definition of mineral processing, indicating, as discussed in the previous section, that these operations are often a part of beneficiation activities. Several commenters stated that this attribute should be written to specifically include operations that enhance the desirable properties of materials, leaving the concern of whether to include heating operations to the first attribute, which defines the delineation between beneficiation and processing.

After review of the comments and analysis of additional information, EPA has acknowledged the need to change this second attribute of mineral processing by modifying the "heat" criterion that considered production steps using heat to alter the chemical composition of ores or minerals (or beneficiated ores or minerals) to be mineral processing operations. The Agency agrees that the use of heat should not be the determining factor, primarily because many beneficiation operations use heat as a pretreatment to enhance the properties of the ore for subsequent beneficiation steps and because EPA does not wish to include operations already established to be beneficiation operations (e.g., leaching, phosphate rock beneficiation) within the domain of mineral processing, particularly if the sole reason for classifying them in this way is the use of heat. Therefore, in today's final rule, the Agency has removed its stipulation that operations using heat are automatically processing operations, but has allowed that operations that enhance the characteristics of the ore or mineral, or beneficiated ore or mineral, are mineral processing if the operations meet the other attributes.

c. *Operation uses feedstock that is comprised of less than 50 percent scrap materials. The 50 percent rule applies to all materials entering a process operation that contain the mineral value rather than all materials entering the operation irrespective of function.* The October 20, 1988 NPRM required that at least 50 percent of the feedstock to an operation be ore or mineral, or beneficiated ore or mineral, for the operation to be considered a primary mineral processing operation. Many commenters responding to that NPRM sought clarification concerning what materials are to be included as part of the "primary" feedstock, recommending that "in-process" materials derived from mineral processing should be considered

"primary" feedstocks along with ores or minerals or beneficiated ores or minerals for the application of this fifty percent rule. In the preamble to the April NPRM, EPA asserted that the attribute, as presented in the October NPRM, affords (1) considerable flexibility to mineral processing operations, in that they are able to accept scrap and intermediate materials in their feedstocks and still be eligible for Bevill status, while (2) still maintaining the essential upper bound on the amount of non-ore present in a feedstock in order to ensure that wastes from operations that primarily process materials other than ores and minerals are not provided with an exclusion that Congress did not intend.

EPA also clarified in the April NPRM that the 50 percent rule applies to all mineral-value containing materials entering a process operation (e.g., crushed copper ore, beneficiated copper ore, in-process materials, and scrap copper for the copper smelters), rather than to the total of all materials (i.e., mineral values plus non-mineral materials such as fuel, reducing agents, or fluxing agents) entering the operation. EPA also clarified that the accounting period over which to analyze feedstock percentages should be one year, which allows for seasonal fluctuations, and that the rule must be applied to individual processing operations (e.g., the smelter separate from the refinery) rather than to an entire plant's operations.

The predominant comment addressing the April, 1989 NPRM again concerned the accounting for in-process materials. Several commenters reasserted that "in-process" materials derived from mineral processing and returned to the process should be considered mineral feedstock since they are used as a matter of course by the industry as feedstock because of their significant mineral value. One industry commenter disagreed with using this attribute at all, calling for EPA to abandon the fifty percent rule because it is an unrealistic and unnecessary restriction and an unwarranted intrusion into the production process.

As stated in the preamble to the April NPRM and further described above, EPA believes that the rule as written provides an extremely flexible tool for screening out secondary processors from the universe of primary mineral processors (the only group eligible for the Bevill exclusion), while allowing (1) large percentages of scrap to be used in primary processing operations and (2) seasonal and other variation in the proportions of feedstock materials

without affecting the potential Bevill status of associated wastes. After reviewing the comments and also noting that this criterion does not, to EPA's knowledge, affect any wastes generated by primary mineral processors, the Agency has decided that it will make no changes in this attribute as first presented in the October NPRM and clarified in April.

d. *Operation produces either a final, or an intermediate to the final, mineral product.* The definition of processing in both the October and April NPRMs requires that, to be eligible for consideration for the Bevill exclusion, the operation must produce either a final mineral product or an intermediate to the final mineral product. EPA believes that products not directly related to mineral processing operations do not fall within the scope of the definition intended by Congress. Several commenters argued that EPA should follow Congress' intended broad view of the term "processing" and include all parts of integrated operations; no commenters, however, directly challenged EPA's position by nominating wastes arising from non-mineral-related processes that may be co-located with mineral process operations for exclusion under Bevill.

In this final rule, the Agency maintains the position articulated in the two proposals; that Congress did not intend the Bevill exclusion to extend to processing operations outside the production of an intermediate or final mineral product, i.e., a material of value derived primarily from an ore or mineral. This attribute ensures that other operations (e.g., chemical processing), even if physically located with a mineral processing operation, that produce a non-mineral product that may or may not be used as a feedstock to a mineral processing operation will not be included within the realm of mineral processing. The Agency also wishes to clarify that the distinction between intermediate and final products refers to whether the mineral value must undergo further mineral processing. Materials that are saleable, either as raw materials to other types of industrial processes (e.g., chemical manufacturing) or as finished products are considered final products. Materials that must undergo further mineral processing to be rendered saleable, or that have no significant value except as a feedstock to a mineral processing operation, are considered intermediate products. Examples of this latter category include ilmenite ore slags used in titanium production and

electrowinning slimes that are processed for metals recovery.

e. *Operation does not combine the mineral product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying); and do not involve fabrication or other manufacturing activities.* The preceding attribute establishes that a mineral processing operation must produce a mineral product, whether final or intermediate. This attribute establishes that once that final product has been produced, no other operations performed on or with that product are considered to be within the realm of mineral processing, i.e., mineral processing has ended. In general, the end of mineral processing is the point at which the processed ore or mineral (1) is combined with another material that is not an ore or mineral, or beneficiated ore or mineral (i.e., combining processed ores or minerals such as steel with purified non-ferrous metals to produce an alloy is not mineral processing), (2) undergoes fabrication (e.g., manufacturing of copper wire), (3) is subjected to other manufacturing operations (e.g., chemical processing), or (4) is marketable and can be sold, even if the product must undergo further non-mineral processing prior to being amenable to an ultimate end use (e.g., titanium tetrachloride, an intermediate product used for the production of titanium metal and titanium dioxide, is saleable and is often sold to other producers for manufacturing inorganic chemicals; any operations following the production of this intermediate, irrespective of whether they occur on-site, are not considered to be within the realm of mineral processing).

The Agency believes that Congress, in adopting the Bevill Amendment, intended to include only those processes that remove, concentrate, and/or enhance values contained in ores and minerals, or beneficiated ores and minerals, and that manufacturing, chemical processing, and alloying operations clearly do not fit into this category. EPA continues to believe that the casting of anodes or cathodes is not a fabrication operation, but is instead an operation necessary for the production of an intermediate or final (i.e., saleable) product and is therefore within the realm of mineral processing.

One general view expressed by many commenters addressing both NPRMs was that EPA should follow Congress' intended broad view of the term "processing" and include all stages from beneficiation through production of final products, including integrated operations. Some commenters offered

specific examples in support of their position.

For example, one commenter objected to EPA's preliminary conclusion that the production of ammoniated phosphates does not constitute mineral processing because it involves further processing of an intermediate mineral processing product, arguing that (1) production of ammoniated phosphates is enhancement of an intermediate to a final mineral product, since phosphoric acid must be further processed in order to be usable as fertilizer and (2) EPA regards ammoniated phosphate production as a part of phosphate processing under the Clean Water Act, and no rational basis exists for reaching a different conclusion under the Bevill Amendment. Other commenters similarly argued that wastes from alloying processes should be included, but nominated no large volume "post-processing" wastes.

In contrast, several other commenters argued that EPA should narrow the definition of processing via this attribute, and not finalize a definition of mineral processing that leaves virtually unchanged the extremely broad 1980 definition of mineral processing. In particular, these commenters stressed that the processing definition should not exempt operations that occur after the identity of the ore or mineral is destroyed. They stated, for example, that in production of titanium dioxide using the sulfate process a "slag" is produced from smelting beneficiated ilmenite ore in an electric arc furnace. This "slag", they argued, is a final mineral product which is then chemically processed (i.e., "washed with sulfuric acid" and "calcined"), and thus operations subsequent to the smelting should not be exempted. Similarly, the commenters argued that, in the case of titanium dioxide production using the chloride process, no wastes generated subsequent to chlorination should be eligible for the Bevill exemption, because titanium tetrachloride is the final mineral product and any subsequent operations are not to be considered processing.

Following review of these comments and additional analysis, EPA has concluded that none of the public comments received on the two proposals or any additional information received by the Agency support any substantial revisions to this attribute, though some clarifications are discussed here. The Agency maintains that Congress did not intend the Bevill exclusion to extend to processing operations that are performed after the production of a saleable mineral product. Phosphoric acid, for example, is

a saleable mineral product that is purchased by diverse industries and has many uses in manufacturing and as a feedstock for further chemical processing. Thus, the manufacture of ammoniated phosphate fertilizer by adding ammonia to phosphoric acid, is not a mineral processing operation; this is chemical processing that uses a saleable mineral product as a feedstock. Likewise, EPA considers titanium tetrachloride, produced during the titanium chloride process, to be a saleable product; any processing subsequent to its production is considered to be chemical processing. In contrast, titanium-bearing slag generated in blast furnaces is considered eligible for continued Bevill exclusion, because although it is a saleable intermediate product, it has no significant end use except for additional mineral processing. Accordingly, the processing of this slag using sulfuric acid digestion is a mineral processing operation rather than a chemical processing operation, and all qualifying wastes from this process are Bevill wastes.

4. Residuals From Treatment of Excluded Mineral Processing Wastes Are Eligible for Exclusion Provided That They Meet the High Volume and Low Hazard Criteria

The October and April NPRMs both articulated EPA's intention to include as processing wastes the residuals from the treatment of excluded mineral processing wastes, but only if those residuals independently meet the criteria for special waste status. Several commenters specifically suggested that for clarity EPA should list for study, in the regulation itself, the category "residues from the treatment of all mineral-processing wastes on the preceding list which are generated at a rate greater than the high volume criterion established by EPA." Other commenters argued that the special waste criteria should not be applied to treatment residuals, recommending that EPA include in the regulation itself on the list for study "residues from the treatment of all mineral processing wastes on the preceding list regardless of the rate of generation." One commenter noted that treatment and discharge of process water in its industry is limited by the Clean Water Act and, as a result, treatment residuals are limited in volume and thus do not meet the high volume criterion because of other regulatory demands. Another claimed that EPA must evaluate actual waste management practices and impacts to human health and the environment before deciding that

residuals are subject to subtitle C. Finally, one commenter stated that EPA should be consistent in applying its definition of process wastewater and include aqueous pollution control residuals with process wastewaters, claiming that EPA provided no rationale for the statement that process wastewater does not include aqueous waste streams from pollution control devices.

After review of the comments, EPA continues to believe that the most appropriate interpretation of the term "solid waste from the processing of ores and minerals" should include pollution control residuals that are presently generated as long as such residuals meet the high volume and low hazard criteria required for all excluded wastes. By including qualifying pollution control residuals on the list of wastes excluded under the Bevill Amendment, the intent of Congress will be achieved by allowing further study of these high-volume, low-hazard wastes. EPA does not believe it appropriate to treat low volume pollution control residuals as exempt wastes regardless of the reason why these wastes are not generated in high volumes.

5. The Processing Definition Could Be Narrowed by Adding a Co-Location Requirement

In the April NPRM the Agency solicited comment concerning whether the definition of "mineral processing" should be further narrowed by confining "mineral processing" to only those mineral processing operations that are co-located with extraction and beneficiation operations. Some commenters encouraged EPA to narrow the definition of processing and include only those processors that are co-located with beneficiation operations, stating that: (1) The co-locational requirement is an inherent aspect of the Bevill exemption, (2) the legislative history never indicated that wastes generated at locations divorced from extraction and beneficiation sites should be exempted, (3) that Congress never intended non-mining industries (e.g., the chemical industry) to have Bevill-exempt wastes, and (4) EPA itself, in the 1980 interpretation, indicated only wastes that are co-located should be exempted.

Many other commenters insisted that EPA do nothing to further narrow the definition of processing, especially by limiting the exemption to processors that are co-located with beneficiation operations. They contended that: (1) This narrowing would be inconsistent with the language of the Bevill

Amendment, the intent of Congress, and the interpretation of the Court, (2) wastes will exhibit the same intrinsic high volume, low hazard, and other characteristics regardless of their location relative to extraction and beneficiation operations, (3) if the Agency ignores site characteristics which directly affect risk (i.e., hazard) potential, then site characteristics which have no effect on risk—such as co-location, must also be disregarded, (4) if EPA relies on the special waste concept to define processing, then the Agency must recognize that the 1978 proposal as well as EPA's Draft Background Document do not give any indication that only processing operations at integrated facilities should be eligible for the Bevill exclusion, (5) many if not most sectors ship from mines to beneficiation and/or processing facilities, (6) co-location could threaten the environment if processing facilities are moved to the sensitive areas in which mines are often located, and (7) no significant domestic extraction or beneficiation occurs in some sectors, making it impossible to perform the processing (e.g., chromite ore roasting/leaching, manufacture of hydrofluoric acid) in close proximity to beneficiation anywhere in the U.S.

After further review, EPA has decided that a further narrowing of the processing definition using a co-location criterion or any other limitation is not appropriate or required by Congressional intent as reflected by the legislative history. Furthermore, the co-location requirement could conceivably create major inequities between facilities within sectors because some facilities in a sector may be co-located while others are not, and between sectors because some sectors rely entirely on foreign ore supplies and others do not; the volume or hazard of wastes in these sectors are largely unaffected by the location of the extraction and beneficiation operations providing their feedstocks. Therefore, EPA will continue to use the definition delineated above (i.e., solid waste uniquely associated with mineral processing and meeting all of the five attributes of mineral processing) and has not employed any additional criteria that would narrow the definition of "mineral processing."

E. Related RCRA Issues

1. Applicability of the Mixture Rule

The April 17, 1989 NPRM stated that EPA would apply the mixture rule to Bevill and non-Bevill mixed waste streams under almost all circumstances. Under this policy, mixtures of one or

more listed hazardous wastes and a large volume, low hazard mineral processing waste would be considered a hazardous waste unless and until the mixture is delisted. EPA proposed, however, that in the case of mixtures of non-excluded "characteristic" wastes and Bevill wastes, the mixture would be considered a hazardous waste if it exhibits one or more of the same hazardous characteristics that are exhibited by the non-excluded waste. If, on the other hand, the mixture exhibits one or more hazardous characteristics exhibited by the Bevill waste but not by the non-excluded characteristic waste, then the mixture would not be a hazardous waste. Furthermore, mixing a characteristic hazardous waste with a Bevill waste would constitute treatment of a hazardous waste, and would be subject to the appropriate regulation for the treatment, storage, or disposal of hazardous wastes, including obtaining a permit.

Several commenters asserted that the Agency's preliminary position on the mixture rule is inappropriately lax and should be modified to regulate co-managed waste mixtures more stringently. These commenters argued that mixtures of Bevill and non-Bevill wastes do not meet the low hazard criterion for Bevill exclusion. Commenters also stated that co-management typically occurs subsequent to initial processing, and thus does not fall within the scope of the Bevill exclusion.

Other commenters argued that the proposed application of the mixture rule is overly strict. These commenters stated that applying the mixture rule as proposed would discourage environmentally protective co-management. Commenters specifically recommended that mixtures of non-Bevill characteristic or listed wastes and Bevill wastes be regulated as hazardous only when the resulting mixture (1) demonstrates a hazardous characteristic not exhibited by the Bevill waste, or (2) is more hazardous than the Bevill waste alone. These commenters stated that the Agency should exempt mixtures of characteristic or listed mineral processing wastes with Bevill wastes when the disposal of the Bevill waste is subject to the requirements of a State or Federal program to control groundwater contamination, provided that the waste is completely characterized such that the effects of mixing on the non-exempt waste can be assessed and considered by the applicable regulatory agency.

Other commenters argued that regulating mixtures of subtitle D extraction and beneficiation wastes and

non-Bevill mineral processing wastes under subtitle C contradicts EPA's July 3, 1986 Regulatory Determination that extraction and beneficiation wastes will be excluded from all aspects of the regulatory program. These commenters requested that the Agency provide a reason for not complying with the Regulatory Determination. In urging the Agency to exempt mixtures of extraction and beneficiation wastes and non-Bevill mineral processing wastes from the subtitle C mixture rule, these commenters drew an analogy to the fact that the Agency has consistently maintained that mixtures of Bevill utility wastes and non-Bevill utility wastes are not subject to regulation under subtitle C. Other commenters, noting that the Agency is concerned that industry might dilute their subtitle C processing wastes with extraction and beneficiation wastes to avoid subtitle C regulation, suggested that the Agency prohibit intentional dilution of hazardous waste streams for the purpose of avoiding subtitle C regulation. These commenters contended that this approach has been taken in the Land Disposal Restrictions Program, and has been endorsed by the D.C. Circuit Court in regulations concerning multi-source leachate.

Some commenters stated that requiring a treatment, storage, or disposal permit when mixing characteristic hazardous wastes with Bevill wastes is particularly onerous. These commenters argued that requiring a permit when mixing wastes would render any relief made available under the proposed modifications to the mixture rule meaningless. Other commenters recommended that immediate elementary neutralization of a RCRA corrosive waste with a Bevill waste should be exempt from RCRA permitting requirements. These commenters argued that such a mixture exhibits no hazardous characteristics, the treatment is instantaneous, and the entire mixture would be inappropriately regulated under subtitle C.

Several commenters recommended that the Agency exempt *de minimis* mixtures of listed hazardous wastes with other mining wastes. These commenters asserted that such a policy would be consistent with the Agency's position regarding the derived-from rule and would result in enhanced protection of the environment. These commenters stated that *de minimis* mixing is sometimes performed in order to comply with NPDES requirements. Other commenters stated that a *de minimis* exemption would be consistent with the findings of the Agency's first Report to Congress, which found that subtitle C

regulation of these waste streams was unnecessary.

Some commenters argued that the proposed modifications to the mixture rule conflict with Congressional and Court ordered requirements to perform studies of particular waste streams. These commenters stated that all processing wastes are temporarily exempt from all provisions of subtitle C—including the mixture rule—until the special study is completed and a Regulatory Determination is completed. Other commenters contended that the Court interpretation of the legislative intent of the Bevill Amendment supports the argument that the beneficial effects of waste mixing should be incorporated into the low hazard criterion, and if insufficient data are available to do so, then the Agency should further study the effects of mixing practices.

Finally, commenters argued that particular waste streams and classes of wastes should not be subject to the modified mixture rule and that they should remain eligible for the Bevill exclusion. Waste streams include bauxite red mud mixed with red scale, Lurgi wet scrubber effluent mixed with alkaline tailings at primary copper facilities, minor waste streams from the electrowinning and refining of gold mixed with tailings, and small amounts of waste mixed with sulfuric acid storage tank clean-out and recirculation water from phosphate processing.

The Agency has reviewed and considered these comments, and has concluded that it is consistent with the intent of Congress and the Court, and most protective of human health and the environment, to continue to apply the mixture rule to Bevill and non-Bevill mixed waste streams as described in the April 17, 1989 NPRM. Only in this way can the Agency ensure that an unintended regulatory exclusion is not afforded (e.g., through intentional dilution with high volume Bevill wastes) to small volume hazardous mineral processing wastes that should rightly be subject to Subtitle C requirements. By so doing, mixtures of small volume mineral processing wastes and Bevill wastes are potentially subject to subtitle C requirements, and the act of mixing them will require a subtitle C treatment permit. For the same reasons, EPA also does not see any reason to carve out particular exceptions for the waste stream mixtures cited by commenters.

Because many facilities may lack historical knowledge of the relevant concentrations of constituents and volumes of the characteristically hazardous non-excluded pre-mixed solid wastes, and pre-mixed Bevill wastes comprising the characteristically

hazardous Bevill waste mixtures, EPA does not believe that a baseline risk approach is feasible. This also is why EPA's approach to these characteristic mixtures differs from the approach retained today regarding listed mixtures. (See also the discussion regarding utility wastes above). Further, concerns over enforceability of alternative approaches have convinced EPA that the approach adopted here is necessary to assure that nonexcluded characteristically hazardous wastes are properly managed and are not improperly mixed with Bevill wastes so as to avoid regulation.

The argument that EPA's position is in conflict with the 1986 Regulatory Determination for extraction and beneficiation wastes or Congressional and Court directives regarding these Bevill wastes is specious; the issue at hand is regulation of low volume hazardous mineral processing wastes, not regulation of Bevill wastes. Non-Bevill mineral processing wastes that are hazardous are subject to all aspects of the subtitle C regulations, including the mixture rule. Mixtures of Bevill and non-Bevill processing wastes will be treated in the same manner, notwithstanding the fact that EPA has not yet studied Bevill processing wastes. Further, even were EPA to agree that the mixture rule were inapplicable to the Bevill waste mixed with hazardous waste, mixtures of listed hazardous wastes with Bevill wastes would continue to be subject to regulation because the "mixture" would "contain" listed hazardous waste, subject to regulation unless delisted. See *Chemical Waste Mgmt., Inc. v. EPA*, 869 F.2d 1526 (D.C. Cir. 1989).

Moreover, the Agency finds no compelling reason to provide exemptions for particular small volume wastes that may be associated with mineral processing operations, such as cleaning wastes. Many other industrial operations also generate such wastes, and EPA does not believe that the fact that current management involving co-management justifies continued regulatory exclusion for wastes that are not uniquely associated with mineral processing (and therefore are not defined as mineral processing wastes) and would not, in any event meet the high volume criterion.

Finally, providing regulatory exclusions for mixtures of Bevill and non-Bevill mineral processing wastes would provide disincentives for developing ways to minimize hazardous waste generation. This would be in direct conflict with one of the Agency's major policy goals, that of pollution prevention.

2. Applicability of the Derived-From Rule

The April 17, 1989 NPRM stated that the Agency will clarify the application of the derived-from rule in a supplemental notice (expected in mid-1989) to the May 6, 1987 proposed rules for boilers and industrial furnaces burning hazardous waste. In the interim, the proposal stated that the Agency would adhere to its prior statements on this issue, i.e., that wastes from comanaging hazardous wastes and Bevill materials remain within the scope of the Bevill exclusion so long as the character of the residues is not significantly affected by the hazardous waste management activity. To the extent that co-combustion residues are significantly affected, they could no longer be considered to truly arise from processing an ore or mineral (or from other activities addressed by the Bevill Amendment). See 50 FR 49190 (November 29, 1985); 52 FR 17012-13 (May 6, 1987) for further information.

Many commenters responded to the proposed rule by requesting that the Agency immediately clarify its position on the derived-from rule and provide a supplemental notice to the final rule for boilers and industrial furnaces. Other commenters argued that Congress clearly did not intend for the Bevill Amendment to exempt the burning of hazardous wastes in smelter furnaces. These commenters further argued that the Agency's position on the derived-from rule rewards dilution as a means of disposal and is unlawful and overly broad. Commenters suggested that if the Agency determines that combustion residuals from burning hazardous waste with Bevill exempt materials are in fact exempt from Subtitle C, then the Agency should include an assessment of the potential health and environmental impacts of burning in the Report to Congress.

Other commenters stated that wastes from industrial furnaces burning hazardous waste fuel should remain under the Bevill exclusion as long as the character of the residue is not significantly affected by the management activity. These commenters argued that the air pollution control residues from hazardous waste-fired kilns are Bevill wastes just as are residues from coal-fired kilns.

The Agency has reviewed and evaluated these comments regarding the derived-from rule. As indicated in the April NPRM, EPA will clarify the application of the derived-from rule in a supplemental notice to the May 6, 1987 proposed rules for boilers and industrial

furnaces burning hazardous waste. We expect this notice to be published during the next several months. Until then, wastes from co-managing hazardous wastes and Bevill materials remain within the scope of the Bevill exclusion so long as the character of the residues is not significantly affected by the waste management activity.

Effects of the Land Disposal Restrictions

Commenters argued that the Agency has misinterpreted the land disposal restrictions (LDR) as they relate to mineral processing. According to commenters, the LDR will not be automatic for non-Bevill mineral processing wastes that exhibit hazardous characteristics as of May 1990. Also, these commenters stated that EPA's statutory mandate to conduct a detailed and comprehensive review of mineral processing wastes requires the Agency to take into account the potential effect of the LDR rulemaking. If the Agency considers eliminating the Bevill exclusion as applied to a particular materials stream, it should, according to these commenters, only do so in the context of a land ban BDAT determination.

The statutory mandate to conduct a detailed and comprehensive review applies only to Bevill wastes, not to the other mineral processing wastes removed from Bevill by today's final rule. Therefore, EPA is under no obligation to consider the effects of potential land disposal restrictions on mineral processors prior to removing non-Bevill mineral processing wastes from the exclusion.

A further question exists as to the status of the wastes withdrawn from the exclusion under the land disposal restriction provisions that establish a schedule for prohibiting untreated hazardous wastes from land disposal. Once withdrawn from the Bevill exclusion, these wastes will be identified as hazardous if they exhibit a hazardous waste characteristic; none will be listed (at least at this time). The statute provides with respect to wastes identified because they exhibit a hazardous waste characteristic that EPA must promulgate prohibitions and establish treatment standards for "all hazardous wastes identified under 3001" by May 8, 1990. RCRA section 3004 (g)(4)(C). (EPA interprets this language as referring to the wastes identified as hazardous as of November 8, 1984, the date of enactment of the HSWA amendments because they exhibit one or more hazardous characteristics.) Wastes newly identified after November 8, 1984 must be prohibited from land disposal, and EPA must develop a

treatment standard for them, within six months after they are newly identified. RCRA section 3004 (g)(4).

EPA believes that the wastes withdrawn from the exclusion are "newly identified" for purposes of these provisions. Although technically the wastes are not being identified by a new characteristic, they are being brought into the subtitle C system after the date of the 1984 RCRA amendments. The Agency plans to address wastes brought in under subtitle C by this rule further in the proposed land disposal restrictions for the Third scheduled wastes.

However, because any hazardous waste, including newly identified wastes, is subject to the requirements of the California List and Solvents and Dioxins final rules, the most important question is how the State programs are affected. Today's final rule removing certain mineral processing wastes from the Bevill exclusion is not being imposed pursuant to the HSWA and therefore today's rule is not effective in authorized states. Thus, as discussed more fully below, today's regulation is applicable only in those states that do not have interim or final authorization. Authorized states that do not have a Bevill exclusion or analog, i.e., all mineral processing wastes are already eligible for regulation as hazardous wastes by the state, are already subject to the land disposal restrictions for California List and Solvents and Dioxins wastes.

4. RCRA Section 3004(x)

As part of the 1984 HSWA Amendments, Congress incorporated a provision allowing the EPA Administrator to relax certain of the Subtitle C standards contained in the new amendments as they relate to the management of mining wastes, utility wastes, and cement kiln dust wastes. This provision, found at section 3004(x), is commonly called the "Simpson Amendment." The Simpson Amendment allows EPA to modify the minimum technical standards for the design, construction, and operation of waste management units, land disposal restrictions, and corrective action requirements for continuing releases, as long as protection of human health and the environment is assured. In the April 17, 1989 NPRM the Agency explained that the provisions of the Simpson Amendment, and hence the opportunity for flexible application of Subtitle C requirements, apply only to the special wastes identified in the statute. Accordingly, the Simpson Amendment would not apply to wastes that are not special wastes and that would therefore

be removed from the Bevill exclusion by the proposed rule.

Commenters argued that EPA's interpretation of the Simpson Amendment as applicable only to wastes retained within the Bevill exemption is incorrect and contrary to the legislative history. These commenters asserted that the legislative history of the Simpson Amendment indicates that it was meant to apply to all mining wastes and that its purpose was to clarify the Agency's authority to develop special standards for wastes removed from the Bevill exemption. On this basis, these commenters urged EPA to adopt a broader position.

Other commenters argued that EPA's reliance on a 1984 Senate report to narrow the scope of the Simpson Amendment is questionable. Because the Simpson Amendment was adopted at a time when EPA's November 1980 interpretation of the Bevill Amendment was the controlling authority, and Congress did not take any action to limit or modify the November 1980 interpretation, "processing" must be understood, according to these commenters, to include wastes from milling, smelting, and refining of ores and minerals. Furthermore, according to these commenters, Congress recognized that some, but not all, special study wastes might become subject to subtitle C, in which case differential treatment under the Amendment would be appropriate.

After reviewing these comments and the intent of the Simpson Amendment, the Agency believes that the provisions of section 3004(x), and hence, the opportunity for flexible application of Subtitle C requirements, apply only to the wastes intended by Congress to be included within the Bevill Amendment exemption, i.e., the special wastes. Accordingly, section 3004(x) would not apply to wastes that are not special wastes and that would therefore be removed from the Bevill exclusion by this rulemaking.

EPA's interpretation of the scope of section 3004(x) is based upon a reading of the legislative history of the amendment. The legislative history is replete with references that 3004(x) was designed to allow flexibility to modify subtitle C for those wastes within the scope of the Bevill amendment, i.e., the special wastes. The Conference Report accompanying 3004(x) explains clearly that it would

Encompass all of the so-called "special study wastes" described in section 8002 (f), (n), (o), and (p) that become subject to regulation under subtitle C. * * * This amendment recognizes that even if some of

the *special study wastes* are determined to be hazardous it may not be necessary or appropriate, because of their special characteristics and other factors, to subject such wastes to the same requirements that are applicable to other hazardous wastes, and that protection of human health and the environment does not necessarily imply the uniform application of requirements developed for disposal of other hazardous wastes."

Conf. Rpt. at 93 (emphasis added). The adoption of section 3004(x) is fully consistent with Congress' concern in 1980 that the special wastes may not necessarily be amenable to full Subtitle C controls due to the large volumes and potentially lower hazards. Such concerns would not hold for wastes which are not high volume, low hazard, and the Conference Report suggests that Congress was not concerned with applying section 3004(x) to such wastes.

The Conference Report goes on to explain that the authority of section 3004(x) "is intended to extend to all of the wastes required to be studied by EPA pursuant to section 8002 (f), (n), (o), and (p), and does not in any way alter the existing scope of section 3001(b)(3)(A)." *Id.* at 94 (emphasis added). Several commenters cited this language to indicate that the 3004(x) was designed to apply to all wastes which EPA defined within the scope of the Bevill amendment as of 1984, i.e., all mineral processing wastes regardless of volume or hazard. EPA does not agree the language can be so read. The Court of Appeals clearly ruled in *EDF II* that Congress never intended the Bevill Amendment to apply to wastes which are not high volume, low hazard special wastes. Thus, even in 1984, the "existing scope" of section 3001 was not as broad as EPA was interpreting it. Congress intended section 3004(x) to apply to those wastes within the scope of the Bevill amendment as Congress, not EPA, interpreted it (i.e., special wastes). EPA notes that the 1983 Senate Report referred to in the April NPRM supports this conclusion, but is not the sole basis for it.

In light of the decision of the Court of Appeals construing Congress' intent in adopting the Bevill amendment in 1980 (prior to the Simpson amendment), the proper reading of section 3004(x) is that it applies only to special wastes as defined by today's final rule. However, EPA does recognize that for certain wastes which are high volume, but also high hazard, there may be valid concerns regarding the amenability of certain subtitle C controls. EPA would appreciate receiving any information regarding these effects in industries affected by today's rule.

F. Administrative Issues

1. Subtitle C and Wastes Withdrawn From the Bevill Exclusion

Commenters recommended that the Agency clarify that surface impoundments managing processing wastes removed from the Bevill exclusion and exhibiting a hazardous characteristic will have four years, as provided for in section 3005(j)(6), to comply with the Minimum Technology Requirements (MTRs). These commenters were concerned that mineral processors newly subject to subtitle C would have to meet the MTRs under the LDR Program.

Other commenters recommended that the Agency impose subtitle C regulations on facilities that fail to properly close and secure units in accordance with all currently applicable requirements within the six month compliance period proposed in the NPRM. As an alternative, these commenters recommended that the Agency require affected facilities to implement a RCRA ground-water monitoring program to assure detection of threats to human health and the environment. Without assurance that no contamination was present, according to these commenters, Subtitle C closure and post-closure requirements must be met so as to characterize and remediate any potential human or environmental threats.

Section 3005(j)(6) provides that surface impoundments that become eligible for interim status after November 8, 1984 as a result of receiving wastes that are hazardous as a result of "additional listings or characteristics for the identification of hazardous waste under section 3001" must comply with MTRs within four years of promulgation of the new listing or characteristic. The wastes that are no longer subject to the Bevill exclusion are not being brought into the subtitle C system as a result of newly promulgated listings or characteristics, but EPA believes that the intended purpose of section 3005(j)(6) is to allow surface impoundments that are newly eligible for interim status after November 8, 1984 to have the same four years to close or retrofit afforded interim status impoundments in existence on November 8, 1984. Consequently, EPA believes that section 3005(j)(6) does apply to the impoundments receiving wastes newly brought into the subtitle C system as a result of today's action. EPA notes that it is adopting a similar construction of section 3004(g)(4) and thus is also viewing these wastes as newly identified for purposes of the land disposal restrictions program. In the

event that there are inconsistencies between requirements under 3005(j)(6) and the land disposal restrictions program, they will be addressed by EPA when the Agency promulgates land ban requirements for these wastes.

2. Opportunities for Public Comment

In the April 17, 1989 NPRM, the Agency provided the public with a 45 day public comment period, during which time the Agency accepted written comments submitted to the Docket Information Center and held a public hearing in Washington, DC. Commenters asserted that by scheduling only one hearing location and date the public was denied full access to the public comment process. Other commenters argued that the public comment period was too short to allow the public adequate opportunity to review and comment on the NPRM. These commenters stated that an additional 30 days should have been allowed for public comment.

The Agency disagrees with these commenters. While the opportunities for public review and comment on the April 17, 1989 NPRM were more limited than the Agency customarily provides, the Agency believes that these opportunities were nonetheless adequate. Furthermore, the public review and comment schedule was driven by the Court-ordered schedule, which prevented the Agency from providing a longer public comment period or additional public hearings. In addition, for many issues, there have been multiple comment periods.

3. Executive Order 12291 Analysis

In the April 17, 1989 NPRM, the Agency explained that section 8 of Executive Order 12291 exempts an agency from the requirements of the Order when compliance would conflict with deadlines imposed by statute or judicial order. Accumulating the information and conducting the analyses required to fully comply with the requirements of sections 2 and 3 of Executive Order 12291 takes many months. Therefore, compliance with these requirements in preparation for the October and April proposed rules was not possible within the schedule specified by the Court for this rulemaking. In the NPRM, the Agency explained that although EPA could not conduct a complete economic impact analysis within the period of time allowed by the Court, the Agency's economic impact analyses conducted in support of previous Agency rulemaking and Report to Congress activities did suggest that the proposal might well not meet the criteria for a "major" rule.

Commenters argued that the Agency is in fact compelled to prepare an economic analysis for this rulemaking. These commenters asserted, without providing alternative analyses or information in support of the assertion, that the rule would qualify as a major rule under each of the three tests used to determine impact under Executive Order 12291. Some commenters argued that the Court clearly indicated that the Agency is required to consider costs and benefits in making Beville decisions (see e.g., EDF I at 1315). Commenters recommended that if the Agency requires additional time to prepare an economic impact analysis, it should request an extension from the Court.

As discussed above and in the October and April proposals, the Agency does not have adequate time to prepare a complete RIA that is fully responsive to E.O. 12291 in connection with this rulemaking. Moreover, the Agency has not received convincing arguments or information that suggest that the rule, in either proposed form or in the form finalized today, would constitute a "major rule," at least not in terms of aggregate financial impacts in excess of \$100 million annually. As far as any obligation to consider economic impact in making Beville exclusion decisions is concerned, EPA's reading of the court decision in EDF I is that economic effects and all of the other RCRA 8002(p) study factors must be evaluated in the Report to Congress and considered in making the regulatory determination for Beville mineral processing wastes, but not in identifying the mineral processing wastes that satisfy the Beville criteria in the first instance. Finally, because EPA is capable of discharging its duties within the time period allotted by the Court, the Agency does not believe that a schedule extension for purposes of conducting an impact study that is not required is appropriate.

Commenters stated that the Agency does not have a basis for claiming that the rulemaking will not constitute a major rule, and therefore that the rule does require a Regulatory Impact Analysis. Sufficient information, according to commenters, was provided to the docket after the October 20, 1988 proposed rulemaking. These commenters stated that the Department of Interior (DOI) has indicated that it possesses the necessary data for conducting a Regulatory Impact Analysis.

EPA disagrees that the information that has been submitted to the docket demonstrates that this action constitutes a major rule. In fact, although the

Agency had requested specific information in the October and April proposals regarding low volume processing wastes that would or might be affected by today's rule, virtually no specific data on such wastes was received in public comment on these proposals. Through past cooperative work with the U.S. Bureau of Mines (BOM), EPA is well aware of the types of information available from DOI concerning mineral processing wastes. While very comprehensive information on numbers and identities of facilities and production and sales volume data are available from BOM, the Bureau has very little information on other variables that are critical to a complete evaluation of regulatory and economic impact, such as waste types, volumes, and characteristics, and waste management practices.

The Agency has made a good faith effort to comply with the requirements of Executive Order 12291 by conducting a comprehensive economic impact screening analysis, as presented below in Section VIII.

4. Regulatory Flexibility Analysis

In the April 17, 1989 NPRM, the Agency explained that Section 608 of the Regulatory Flexibility Act (RFA) allows the Administrator to waive or delay completion of the RFA screening analysis in response to an emergency that makes compliance with the requirements of section 603 or the Act on a timely basis impracticable. In this instance, the court-imposed deadlines for publication of the October and April proposed rules have prevented EPA from conducting a complete screening analysis of potential small business impacts in time to support the rulemaking process, especially given that more than 100 mineral commodity sectors would have required screening for potentially hazardous waste and the presence of significantly affected small business entities. In both the October and April NPRMs the Agency solicited comment and specific information relating to specific small businesses or individual commodity sectors that produce ore or mineral processing wastes that could, by virtue of the potential hazardous characteristics of such wastes, be subject to adverse impacts by today's rule.

Commenters responded by stating that the Agency has inadequately evaluated the rule's impact on small businesses, but no commenters provided any specific information related to small business firms or potentially affected sectors. Nonetheless, these commenters stated that the Agency should recognize that enterprise ownership patterns vary

appreciably between mineral-industry sectors, and therefore, the extension of information from the nonferrous and ferroalloy producing sectors to the nonmetallic ore and mineral processing sectors is inappropriate. These commenters asserted that the Bureau of Mines could provide information necessary to support a screening study.

In section IX of this preamble, the Agency presents a comprehensive analysis of the impacts of this rulemaking on small businesses.

G. Comments Addressing Nine Wastes for which Final Beville Status is Established by Today's Rule

This section summarizes public comments received by EPA addressing nine potentially high volume wastes on which the Agency proposed to take final action in the April NPRM. EPA's decisions regarding the Beville status of these materials are presented in section IV, below, though responses to a limited number of specific questions and issues raised by commenters are addressed in this section.

1. Slag From Primary Copper Processing

Several commenters supported EPA's proposal to retain primary copper smelting slag within the Beville Amendment exclusion as a high volume, low hazard mineral processing waste. They noted that slag from primary copper smelting constitutes a low hazard waste according to a study supported by EPA. They further agreed that all types of copper processing slag (i.e., reverberator furnace, converter, and refining slag) should be aggregated to meet the volume criterion. One commenter stated that its anode and converter slag is not discarded but recycled to smelters and claimed this to be a standard practice at U.S. smelters. That same commenter noted that its reactor slag is an intermediate product that is processed in a slag concentrator using beneficiation activities (i.e., cooling, grinding, flotation) and that other facilities either discard or clean the slag. They claimed that water extract tests in which only one of 15 samples exceeded EP toxicity levels have demonstrated that the waste is low hazard.

Other commenters disagreed with EPA's proposal to retain copper slag. They indicated that the waste sampling effort conducted for the draft mineral processing waste Report to Congress revealed that one of the eleven samples of copper slag exhibited the EP toxicity characteristic. In addition, the waste contained elevated leachable levels of arsenic, cadmium, and lead. Water

extraction sampling also revealed that the waste contains leachable arsenic and cadmium at concentrations exceeding the EP trigger level. They noted that data from the draft Report to Congress demonstrate exceedances of the AWQC for copper smelting slag; cadmium exceeds the AWQC by up to 9,000 times, copper by up to 9,000 times, and lead by up to 15,000 times.

One commenter who in the past used copper slag for construction purposes in the state of Washington objected to the inclusion of slag from primary copper smelting, specifically objecting to the classification of copper smelting slag as nonhazardous. This commenter contended that contamination caused by copper smelting slag in the Tacoma, Washington area has been documented in numerous reports. In 1983, they claimed, the Tacoma Pierce County Health Department issued a notice advising against consumption of bottom fish from the Hylebos waterway and against regular consumption of fish from other waterways in the area because of the presence of arsenic and lead in fish caused in part by smelting slag.

EPA today finalizes the decision to leave copper slag within the exclusion for study. Data recently collected by EPA (using Method 1312) confirms that this waste passes the hazard screening criterion. Furthermore, 1310 data developed from the same sample fails to confirm the results cited by the commenter.

2. Slag From Primary Lead Processing

A commenter supported EPA's proposed retention of lead processing slag, but indicated a concern that only smelting and not refining slag may have been included. They requested that if this is EPA's position, that the Agency modify its definition to include refining slag.

Other commenters disagreed with EPA's proposal to include lead slag, arguing that slag from primary lead processing cannot be considered low hazard under any reasonable definition. They indicated that the waste sampling effort conducted for the draft mineral processing wastes Report to Congress revealed that all five of the plants generating this waste and thirteen of seventeen samples of slag from lead processing exhibited the EP toxicity characteristic. Two of the five facilities failed for cadmium; three of the five facilities and eight of the 17 total samples exceeded the drinking water standard for lead by more than 1000-fold; and one of the plants exceeded 100 times the drinking water standard for cadmium even when leached with water. All samples of granulated or hot

dumped slag exhibited the EP toxicity characteristic; only the dezinced slag passed the characteristic test. They noted that data from the draft Report to Congress demonstrate exceedances of the AWQC for copper smelting slag; cadmium exceeds the AWQC by up to 8,000 times, zinc by up to 2,100 times, and lead by up to 68,000 times.

EPA today finalizes the decision to leave lead slag within the exclusion for study. Data recently collected by EPA (using Method 1312) confirms that this waste passes the hazard screening criterion at three facilities. The data cited by the commenters is not determinative of whether the waste will remain within the exclusion under today's screening criterion.

3. Red and Brown Muds from Primary Bauxite Processing

Commenters supported the Agency's proposed retention of red and brown muds from bauxite refining within the mining waste exclusion. They agreed that red and brown muds satisfy the definition of mineral processing and meet the low hazard and high volume criteria. The commenters further claimed that should red and brown muds incorrectly be classified as hazardous waste, a large share of the hazardous waste storage capacity in the U.S. would be consumed with no increased benefit or protection to the environment. One commenter further argued that this waste is from a mineral beneficiation, not mineral processing waste.

Red and brown muds are created by an alkaline digestion operation; they therefore constitute mineral processing wastes.

4. Phosphogypsum From Phosphoric Acid Production

A number of commenters supported EPA's proposal to retain phosphogypsum within the Bevill exclusion. They agreed that phosphogypsum meets the high volume and low hazard criteria and should be retained in the Bevill exclusion. Additionally, they contended that compliance with subtitle C requirements, including land disposal restrictions, in the management of phosphate rock is not possible. Where technologically feasible, compliance would require expenditures that cannot be sustained by the fertilizer industry. Several industry commenters claimed that the exclusion for phosphogypsum will be meaningless if the rainwater falling on these stacks also is not exempted, noting that the collection of this rainwater runoff is an integral part of the processing of phosphate rock as

this processing could not legally occur if the runoff was not collected and managed in accordance with the NPDES program.

Commenters argued further that phosphogypsum should not be considered separately from the recirculating process water with which it is linked. Process water is used to convey phosphogypsum to management areas and serves a critical function in maintaining water balance. Water used to transport phosphogypsum is generated at a different point in the production process only where it is recirculated. The commenters asserted that separate consideration of phosphogypsum and process wastewater does not comport with the Agency's historical approach to the Bevill Amendment.

Other commenters, in contrast, criticized EPA's proposal to retain phosphogypsum from phosphoric acid production within the Bevill exclusion. They claimed that phosphogypsum, under any reasonable definition, is not low hazard. Of the 10 plants sampled in a study contracted by EPA, 14 of 19 samples exceeded 100 times the MCLs for alpha particle radioactivity, radium-226, or both. Furthermore, adequate data exist to document the health risks associated with radioactive uranium and phosphate wastes. They asserted that: (1) EPA data indicate that the health risks from phosphogypsum stacks and ponds exceed the Agency's acceptable levels by a factor of eight, (2) phosphogypsum piles are located in areas of heavy rainfall where leaching of wastes occurs, and (3) the piles are located in heavily populated areas and in close proximity to ground water. Therefore, they contended, phosphogypsum should be regulated as a hazardous waste. EPA's failure to consider radionuclides as hazard is arbitrary, especially since EPA has previously recognized that waste with 20pCi/g constitutes more than a low level hazard and the EPA Draft Background Information Document entitled "Radionuclide Emissions from Phosphogypsum Stacks-Risk Assessment" shows phosphogypsum to have an average radium 226 concentration of 31 pCi/g, plus significant levels of other radionuclides. The commenters also expressed concern over the disposal of phosphogypsum filter pan residue on these piles as the residue has concentrations of radionuclide 2 to 3 orders of magnitude higher than normal phosphogypsum.

EPA has reviewed these comments and has elected to retain phosphogypsum within the Bevill

exclusion because it passes all of the final Bevill mineral processing wastes criteria. The type(s) and magnitude of risk posed by this material, including its radioactive constituents, will be addressed in the forthcoming Report to Congress.

The Agency also wishes to reiterate its position regarding the definition of phosphogypsum, as articulated in the April NPRM. Phosphogypsum and the process water that is used to remove it to disposal represent two separate waste streams that could, if the industry desired, be managed separately. The Agency understands that when the phosphogypsum waste stream leaves the mineral processing circuit it is not entrained in the process water, but is a semi-solid residue from a filtering operation. The solid waste is *then* entrained in the process water in order to transport the waste to gypsum stacks for disposal. While alternative transport systems may be impractical, the fact remains that there exist two waste streams capable of being managed separately which must be considered separately for this rulemaking. Therefore, only phosphogypsum will be unconditionally retained within the Bevill exclusion for today's ruling.

EPA will address the status of process wastewater from phosphoric acid production, including its components (i.e., the gypsum stack run-off issue) in the September, 1989 proposal.

5. Slag From Elemental Phosphorus Production

Commenters supported EPA's proposal to retain slag from elemental phosphorus production within the Bevill Amendment. They claimed that phosphorus industry materials streams are generated by "mineral processing" operations as defined by the EPA, are high volume wastes, and are not high hazard wastes.

6. Furnace Scrubber Blowdown From Elemental Phosphorus Production

Some commenters supported EPA's proposal to retain furnace scrubber blowdown from elemental phosphorus production within the Bevill Amendment. They claimed that phosphorus industry materials streams are generated by "mineral processing" operations as defined by the EPA, are high volume wastes, and are not high hazard wastes.

Other commenters objected to including furnace scrubber blowdown within the Bevill exclusion. They contended that furnace scrubber blowdown from phosphorus production cannot be considered low hazard under any reasonable definition. Of the two

plants sampled in a study contracted by EPA, both plants yielded samples that exceeded 100 times the MCLs for alpha particle radioactivity, radium-226, or both. One plant exceeded the EP standard for cadmium, while the other exceeded the MCL for arsenic by more than 10-fold, and exceeded the 10-5 cancer risk level by almost 850 fold.

7. Acid Plant and Scrubber Blowdown from Primary Copper Processing

Several commenters argued that acid plant blowdown and Lurgi scrubber effluent should be retained in the Bevill exclusion because they meet both the high volume and, at least at some facilities, the low hazard criteria. One commenter asserted that acid plant and scrubber blowdown from primary copper processing should not be eliminated from the Bevill Amendment based on its failure of EPA's low hazard test. They stated that the Agency should consider the burden of compliance for sectors eliminated from the Bevill exclusion. The commenter that claimed to have a low hazard waste stated that: (1) Their alkaline tailings are mixed with the waste which neutralizes the blowdown/Lurgi mixture, and (2) metals in the waste, by operation of internal chemical processes, become tightly bound in the matrices of various complex hydroxides contained in the tailings in which they are mixed, thus producing a minimal risk of leaching. Therefore, the representative samples of the Lurgi/blowdown/tailings mixture are not EP toxic. Additionally, they contended that the mixture poses no threat of release into the environment because the waste is deposited in a tailings pond on a deep tailings base which serves as an effective seal from migration into soil or groundwater, the waste is deposited a great distance from drinking water, and the commenter's facilities are located in an arid, unpopulated region.

Other commenters agreed with EPA's proposal to remove acid plant and scrubber blowdown from primary copper processing from the Bevill exclusion, arguing that blowdown from primary copper processing cannot be considered low hazard under any reasonable definition. They noted that the waste sampling effort conducted for the draft Report to Congress revealed that all samples of copper acid plant blowdown exhibited the EP toxicity characteristic. In addition, they indicated that the waste contained elevated leachable levels of arsenic, cadmium, and mercury, and that the acid plant blowdown samples exceeded EP characteristic trigger levels; the mercury concentrations exceeded by up

to 99.5 times, and the cadmium concentrations exceeded by a factor as high as 24.5. They also noted that water extraction sampling also revealed that the waste contains leachable arsenic and cadmium at concentrations exceeding the EP trigger level. They contended that data from the Draft Report to Congress demonstrate exceedances of the AWQC for copper smelting slag; cadmium exceeds the AWQC by up to 25,000 times, arsenic by up to 1,930 times, and mercury by up to 30,000 times.

8. Acid Plant Blowdown from Primary Lead Processing

One commenter contended that acid plant blowdown from primary lead processing should not be eliminated from the Bevill Amendment based on its failure of EPA's low hazard test. The commenter maintained that lead processing acid plant blowdown and scrubber blowdown fall within the definition of process wastewaters and meet the high volume criterion; therefore, the waste should be studied.

9. Air Pollution Control Scrubber Blowdown from Primary Tin Processing

The single tin processor in the U.S. submitted in response to the October NPRM that it generated on average 68,000 metric tons of blowdown, which they claimed is a relatively dilute stream in the neutral pH range, and is similar to smelters in the lead and copper smelters. No comments were received in response to the April NPRM.

EPA need not address in detail the comments on the hazard status of phosphorous furnace scrubber blowdown and acid plant blowdown from copper, lead, and tin. These liquid wastes all fail the volume criterion.

III. Final Criteria for Defining Bevill Mineral Processing Wastes

A. Definition of Mineral Processing Wastes

For purposes of this rule, mineral processing wastes are generated by operations downstream of beneficiation (as codified by today's rule) and originate from a mineral processing operation as defined by the following elements:

- (1) Excluded Bevill wastes must be solid wastes as defined by EPA.
- (2) Excluded solid wastes must be uniquely associated with mineral industry operations.
- (3) Excluded solid wastes must originate from mineral processing operations that possess all of the following attributes:

a. Follow beneficiation of an ore or mineral (if applicable);

b. Serve to remove the desired product from an ore or mineral, or from a beneficiated ore or mineral, or enhance the characteristics of ores or minerals, or beneficiated ores or minerals;

c. Use mineral-value feedstocks that are comprised of less than 50 percent scrap materials;

d. Produce either a final mineral product or an intermediate to the final product; and

e. Do not combine the product with another material that is not an ore or mineral, or beneficiated ore or mineral (e.g., alloying), do not involve fabrication or other manufacturing activities, and do not involve further processing of a marketable product of mineral processing.

(4) Residuals from treatment of excluded mineral processing wastes must be historically or presently generated and must meet the high volume and low hazard criteria in order to retain excluded status.

Beneficiation operations include crushing, grinding, washing, dissolution, crystallization, filtration, sorting, sizing, drying, sintering, pelletizing, briquetting, calcining, roasting in preparation for leaching (to produce a final or intermediate product that does not undergo further beneficiation or processing), gravity concentration, magnetic separation, electrostatic separation, flotation, ion exchange, solvent extraction, electrowinning, precipitation, amalgamation, and heap, dump, vat, tank, and *in situ* leaching.

Processing operations generally follow beneficiation and include techniques that often destroy the ore or mineral, such as smelting, electrolytic refining, and acid attack or digestion. EPA also wishes to emphasize that operations following the initial "processing" step in the production sequence are also considered processing operations, irrespective of whether they involve only the techniques defined above as beneficiation. Therefore, solid wastes arising from such operations are considered mineral processing wastes, rather than beneficiation wastes.

B. The High Volume Criterion

High volume mineral processing wastes are defined as (1) non-liquid

mineral processing wastes that were generated at an average annual rate of greater than 45,000 metric tons per year per facility, and (2) liquid mineral processing wastes that were generated at an average annual rate of more than 1,000,000 metric tons per year per facility during any year between 1983 and 1988.

For the purposes of this rulemaking, the volume criterion for non-liquids has been and will be used to determine if both solid (e.g., slag, phosphogypsum) and semi-solid (e.g., waste treatment sludge) materials are high volume. The volume criterion for liquids has been used to determine whether wastewaters and other aqueous wastes are high volume. Professional judgment will be employed in deciding which criterion to apply to a particular waste stream. The Agency considered the possibility of using a quantitative measure, such as percent solids, to distinguish between liquid and non-liquid materials, but concluded that such an approach would lead to results that are inconsistent with the purpose of employing separate criteria for defining large volume liquid and large volume non-liquid wastes. Specifically, the solids content of some liquid wastes generated by mineral processing operations may be higher than the solids content of some sludges resulting from the treatment of other mineral processing wastes, in spite of the fact that a major volume reduction operation (such as settling) has yet to be performed on the untreated liquid waste. Therefore, use of quantitative criteria might result in inappropriately considering a waste that has a solids content above the cut-off but for which additional volume reduction is likely (such as may occur as a result of treatment and discharge of wastewater), to be large volume, or vice versa.

The final volumetric cut-offs presented here reflect some of the largest quantities of individual and identifiable waste streams managed at facilities that are currently in the Subtitle C regulatory system. EPA developed the information supporting these cut-offs in direct response to comments reflecting both sides of this issue criticizing the Agency's less complete justification of the volume criterion cut-off values contained in the October and April proposals. For each facility responding to EPA's TSDR

Survey (discussed above), the Agency first determined whether they operated an on-site hazardous waste landfill or on-site hazardous wastewater management units (wastewater treatment systems, treatment tanks, surface impoundments, or underground injection wells). Data pertaining to landfill disposal were used to develop the criterion for non-liquids and data regarding wastewater management units were used to derive the criterion for liquids. Because mineral processing wastes are typically inorganic, any solid/sludge materials that are solid wastes and are not recycled and might be regulated under subtitle C would have to be disposed in a subtitle C landfill. Therefore, establishing a volume criterion for these materials requires analysis of hazardous waste disposal in subtitle C landfills. Similarly, because liquid mineral processing wastes are generally aqueous and thus may be managed using one or more of several different techniques, EPA analyzed all of the significant technologies employed to manage hazardous wastewater under subtitle C. In both cases, the Agency identified the largest individual waste stream managed by an appropriate technique at each facility (i.e., one hazardous waste stream per facility), then computed univariate statistics on the resulting distribution. (This is the same basic approach used by certain commenters who proposed volume cut-offs utilizing data from EPA's 1985 Biennial Survey.) The final volumetric criteria represent approximately the largest individual waste stream managed by the facility at the 95th percentile of the relevant distribution. Relevant data are presented in Table 1. The Agency believes that the 95th percentile of the largest individual waste stream managed at each facility both provides a meaningful measure of the amenability of subtitle C controls to different waste types, and represents a reasonable overlap between Subtitle C wastes and Bevill wastes. EPA also notes that this value is a compromise between commenters that favored using the 99th percentile and those that favored the 90th percentile.

TABLE 1.—UNIVARIATE STATISTICS ON SOLID AND LIQUID HAZARDOUS WASTES

[All quantities in metric tons managed in 1986]

	Solids	Wastewaters
Percentile:		
100	194,319	44,307,857
99	77,443 or 194,319 ²	4,589,261 or 4,999,573
95	41,540 or 46,192	1,098,412 or 1,112,680
90	31,505 or 31,746	348,230 or 358,224
75	10,072 or 10,815	49,039 or 49,105
Number of facilities	88	964

¹ For a detailed discussion of the derivation of these data, see the docket for this rulemaking.² The two different numbers reflect results using two different and equally valid techniques for computing univariate statistics. Large differences indicate significant uncertainty with respect to that portion of the distribution.

The Agency believes that by developing the final volume criterion in this manner, it has resolved all of the significant issues raised in public comment on the high volume criterion presented in the two proposed rules. First, the basis of comparison (recent Subtitle C waste management) is the most relevant to addressing the question at hand (amenability to Subtitle C controls). Second, the way in which the comparison was developed is more internally consistent than in the previous analysis; EPA developed a criterion from data on hazardous waste management of individual waste streams and will apply this criterion to individual mineral processing waste streams. Third, the two separate criteria that are presented here reflect the highly significant differences in treatment processes and treatment residuals management options that exist between nonliquid and liquid wastes. As stated in the April NPRM, it is more technically feasible to manage large volumes of wastewater than it is to manage large volumes of solids, because wastewater treatment effluent (by far the largest treatment residue in most cases) can typically be discharged or recycled while solids must often be land-disposed. Finally, in developing this approach, EPA has reconsidered its earlier position and included commercial hazardous waste management facilities in the database used to develop the cut-offs for the final high volume criterion, because the issue at hand is technical feasibility of Subtitle C waste management; considerations of differential economic incentives facing operators of commercial and private hazardous waste management facilities are not relevant in resolving this issue. Therefore, the Agency selected a volume criterion of 45,000 metric tons per year per facility for non-liquid mineral processing wastes and 1,000,000 metric tons per year per facility for liquid mineral processing wastes to correspond to approximately the 95th

percentile (and rounded off so that the criterion could be easily expressed; the rounding had no effect on any waste stream's status).

C. The Low Hazard Criterion

1. The Toxicity and Mobility Test

A high volume mineral processing waste is not low hazard and, therefore, is not eligible for the temporary exclusion from Subtitle C requirements provided by the Bevill Amendment if:

- Available data indicate that waste extracts obtained using EPA Method 1312 and analyzed using established SW-846 methods contain concentrations of arsenic, barium, cadmium, chromium, lead, mercury, selenium or silver that exceed 100 times the MCL for the constituent at two or more facilities that generate the waste, unless:

- i. The waste is generated at five or more facilities; and
- ii. Substantial additional relevant data are available and the preponderance of these additional data indicate that the waste should be considered low hazard, where:

- a. Relevant data are defined as data that result from analysis of waste extracts obtained by EPA Methods 1310, 1311, and 1312, ASTM Test Method D3987-81, or comparable procedures that the Agency has reason to believe produce reliable and representative data; and

- b. To be considered substantial, the additional data must characterize the waste at 3 plants (other than those two plants where Method 1312 results exceed 100 times the MCLs) or at least half of the facilities that generate the waste (other than those two plants where Method 1312 results exceed 100 times the MCLs), whichever number of plants is larger.

- Constituent concentrations measured in waste sample extracts obtained using Method 1312 are used to determine facility-level values as follows:

- i. If data for only one sample of the waste are available, then these data determine the facility-level constituent concentrations; and

- ii. If data on two or more samples are available, then the lower bound of the 80 percent confidence interval of the mean of the data⁷ serves as the facility-level constituent concentrations, where the confidence interval is calculated for each waste for each constituent using all results (from all plants generating the waste) available from testing of the waste using Method 1312.

This criterion is more complicated than the low hazard criterion proposed in April in two respects: (1) It requires that the 80 percent confidence interval for the mean be calculated for each constituent and each waste type; and (2) It requires consideration of data other than Method 1312 results, including data based on Method 1310 and 1311 that were provided in public comments or in response to the mineral processing waste survey or the "3007 letter" request for waste characteristics information.

Nonetheless, EPA believes that these modifications are appropriate because they allow EPA to make use of data that the Agency specifically requested that industry provide, while avoiding biases inherent in other alternatives for including these data. Moreover, the revised low hazard criterion is directly responsive to commenters who indicated that it was inappropriate, i.e., inconsistent with the spirit of the Bevill exclusion, for a screening criterion to remove the exclusion from a waste that "fails" the low hazard criterion at two facilities while "passing" the criterion at many more other facilities.

⁷ The 80 percent confidence interval is recommended (guidance) in chapter 9 on sampling in SW-846 as the confidence interval to be used for evaluating whether wastes pass or fail regulatory thresholds. Because the low hazard criterion is being used as a screening test to remove wastes that are clearly not low hazard from the Bevill exclusion, EPA is comparing the lower bound of the 80 percent confidence interval with the relevant standards.

2. The pH Test

A high volume mineral processing waste is not low hazard and, therefore, is not eligible for the temporary exclusion from Subtitle C requirements provided by the Bevill Amendment if:

- Fewer than five facilities generate the waste and the pH (determined as required by 40 CFR 261.22) is less than one (1) or greater than 13.5 at two or more facilities that generate the waste, or if five or more facilities generate the waste and the pH is less than one (1) or greater than 13.5 at 50 percent or more of the facilities that generate the waste.

• pH values measured for waste samples are used to determine facility-level values for individual candidate low hazard wastes as follows:

- i. If a datum for only one sample from a facility is available, this datum determines the facility-level pH; and
- ii. If data on two samples from a facility are available, the lower value determines the facility-level pH; and
- iii. If data on more than two samples from a facility are available, the median value defines the facility-level pH.

The changes to the pH test from the April NPRM (i.e., the protocol for

considering additional data) were made for the same reasons as discussed above with respect to the toxicity and mobility test.

IV. Final Bevill Status of Selected Mineral Processing Wastes

The present status of all candidate Bevill mineral processing wastes that were proposed either for retention within or removal from the exclusion in either the October or April proposals is presented in Table 2.

TABLE 2.—CURRENT STATUS OF PREVIOUSLY PROPOSED CANDIDATE BEVILL MINERAL PROCESSING WASTES

Commodity sector	Waste stream	Status	Reason for Bevill Status
Bauxite	Red and Brown Muds	Retained	Passes all Bevill Criteria.
Beryllium	Barren Filtrate	Removed	Low Volume.
	Bertrandite Thickener Slurry	Subtitle D+ Program	Reclassified as Beneficiation.
	Processing Raffinate	Removed	Low Volume.
	Process Water	Removed	Low Volume.
Cerium	Roast/Leach Ore Residue	Conditionally Retained	Passes High Volume.
Chromite	Cooling Tower Blowdown	Removed	Low Volume.
Coal Gas	Gasifier Ash	Conditionally Retained	Passes High Volume.
	Process Wastewater	Conditionally Retained	Passes High Volume.
Copper	Acid Plant Scrubber Blowdown	Removed	Low Volume.
	Bleed Electrolyte	Removed	Low Volume.
	Calcium Sulfate Sludge from WWT	Conditionally Retained	Passes High Volume.
	Process Wastewater	Removed	Low Volume.
	Slag	Retained	Passes all Criteria.
	Slag Tailings	Conditionally Retained	Passes High Volume.
Elemental Phosphorus	Furnace Off-Gas Solids	Conditionally Retained	Passes High Volume.
	Furnace Scrubber Blowdown	Removed	Low Volume.
	Process Wastewater	Removed	Low Volume.
	Slag	Retained	Passes all Criteria.
Hydrofluoric Acid	Fluorogypsum	Conditionally Retained	Passes High Volume.
	Process Wastewater	Conditionally Retained	Passes High Volume.
Iron	APC Dust/Slurry from Blast Furnaces	Conditionally Retained	Passes High Volume.
	Blast Furnace Slag	Conditionally Retained	Passes High Volume.
Lanthanides	Ammonium Nitrate Process Solution	Removed	Low Volume.
Lead	Acid Plant Blowdown	Removed	Low Volume.
	Process Wastewater	Conditionally Retained	Passes High Volume.
	Slag	Retained	Passes all Criteria.
Lightweight Aggregate	APC Dust/Sludge	Conditionally Retained	Passes High Volume.
	Scrubber Wastewater	Removed	Low Volume.
Magnesium	Wastewater from the Anhydrous Process	Conditionally Retained	Passes High Volume.
Molybdenum	Selenium Pl. Effluent from Processing APB	Removed	Low Volume.
Phosphoric Acid	Phosphogypsum	Retained	Passes all Criteria.
	Process Wastewater	Conditionally Retained	Passes High Volume.
Soda Ash	Wastes from Trona Ore Processing	Subtitle D+ Program	Reclassified as Beneficiation.
Steel	Steel (BOF and OHF) APC Dust/Sludge	Conditionally Retained	Passes High Volume.
	Steel (BOF and OHF) Slag	Conditionally Retained	Passes High Volume.
Tin	Air Pollution Control Scrubber Blowdown	Removed	Low Volume.
Titanium	Chloride Processing Waste Acids	Removed	Low Volume.
	Chloride Processing Waste Solids	Conditionally Retained	Passes High Volume.
	Leach Liquor	Removed	Low Volume.
	Sulfate Processing Waste Acids	Conditionally Retained	Passes High Volume.
	Sulfate Processing Waste Solids	Conditionally Retained	Passes High Volume.
Zinc	Acid Plant Blowdown	Removed	Low Volume.
	Process Wastewater	Removed	Low Volume.
	Zinc-Lean Slag	Conditionally Retained	Passes High Volume.

For today's final rule, EPA has applied the criteria described above to all waste streams for which it has sufficient information to make regulatory decisions. The data supporting these decisions were provided in the October and April proposals. Based upon these data and new sampling and analysis

results (Method 1312) which may be found in the docket for today's rule, the following five wastes are retained within the Bevill exclusion:

1. Slag from primary copper smelting;
2. Slag from primary lead smelting;
3. Red and brown muds from primary bauxite refining;

4. Phosphogypsum from phosphoric acid production; and

5. Slag from elemental phosphorus production.

EPA has determined that each of these materials meets the definition of a waste from mineral processing operations, is generated at an annual

rate exceeding the relevant final volume criterion (45,000 metric tons per year per facility for nonliquid wastes) and passes the final low hazard criterion (i.e., does not fail the toxicity and mobility or pH tests at two or more facilities).

Twenty wastes are conditionally retained within Bevill because they appear, based upon currently available data, to meet the final high volume criterion; the data needed to implement the low hazard criterion for these wastes, however, is currently unavailable. Most of these wastes were proposed for conditional exclusion in the April proposal. Two wastes (process wastewater from hydrofluoric acid production, and APC dust/slurry from carbon steel (open hearth and basic oxygen furnace) production) have been added because of information received in public comment on the April notice, as interpreted by best professional judgment.

Eighteen specific wastes proposed either for conditional retention or for removal on the basis of hazard, in addition to the list of small volume wastes provided in the April NPRM (see 54 FR 15343-4) (or any other small volume or speculative wastes, whether or not nominated for conditional exclusion), are hereby removed from the Bevill exclusion. All are liquid wastes that are generated in quantities well under the final one million metric ton per year per facility cut-off, based upon available EPA data and data submitted to the Agency in public comment.

Finally, a small number of wastes that EPA either proposed for retention in April or were nominated in public comment on the October or April proposals have been reclassified as beneficiation wastes, and hence will be addressed by the RCRA subtitle D program for mineral extraction and beneficiation wastes that EPA is currently developing. These include, but are not limited to, wastes from trona ore processing and bertrandite thickener slurry from primary beryllium production (both proposed in April), and sulfate leach ore residue from primary copper production (nominated by a commenter on the April NPRM).

V. Schedule for Final Resolution of Bevill Status for All Remaining Candidate Bevill Mineral Processing Wastes

As discussed above, the Bevill status of all potential high volume, low hazard mineral processing wastes will be proposed by EPA by September 15, 1989. Following receipt and analysis of public comments on these proposed exclusion decisions, the Agency will articulate final action on each candidate Bevill

waste in a final rule by January 15, 1990. At this time, the universe of Bevill-excluded mineral processing wastes will be established, and no additional wastes will be added.

Today's final rule includes a revised list of conditionally retained wastes (see Table 2, above). Modifications to this list, which was originally published in the April NPRM, have been made to reflect new information received in public comment on the April notice, and professional judgment in applying the final Bevill mineral processing wastes criteria to EPA's data on the specific mineral production operations that generate candidate Bevill wastes and on waste generation rates. Some of the wastes designated today as being conditionally retained wastes may be proposed for removal from the Bevill exclusion in September if the survey and/or waste sampling and analysis data that the Agency is currently collecting indicate that they do not pass both the high volume and low hazard criteria. In no event, however, will additional mineral processing wastes be considered for retention within the Bevill exclusion.

VI. Regulatory Implementation and Effective Dates of the Final Rule

As of the effective date of this final rule, mineral processing wastes that have been temporarily excluded from regulation under subtitle C of RCRA since 1980, except the 25 "special wastes" described above, may now be subject to subtitle C requirements beginning in February 1990 (i.e., six months after this notice appears in the Federal Register) in those states that do not have authorization to administer their own hazardous wastes program in lieu of EPA. Generators, transporters, and TSD facilities in authorized states will be subject to RCRA requirements imposed as a result of this rule only after the state revises its program to adopt equivalent requirements and EPA authorizes the revision. The requirements imposed as a result of removing the temporary exclusion include: determining whether the solid waste(s) exhibit hazardous characteristics (40 CFR 262.11); obtaining an EPA identification number for managing hazardous wastes (40 CFR 262.34); complying with recordkeeping and reporting requirements (40 CFR 262.40-262.43); and obtaining interim status and seeking a permit (or modifying interim status, including permit applications or modifying a permit, as appropriate) (40 CFR part 270).

A. Section 3010 Notification

Not later than November 30, 1989, all persons who generate, transport, treat, store, or dispose of wastes removed from temporary exclusion by this rule and which are characteristically hazardous under 40 CFR part 261, subpart C, will be required to notify either EPA or an authorized State of these activities pursuant to section 3010 of RCRA. Notification instructions are set forth in 45 FR 12746, February 26, 1980. Persons who previously have notified EPA or an authorized State of their activities pursuant to section 3010 of RCRA, i.e., persons who previously have notified EPA or an authorized state that they generate, transport, treat, store or dispose of hazardous waste and have received an identification number (see 40 CFR 262.12, 263.11 and 265.1) need not re-notify.* Persons without EPA identification numbers are prohibited from generating, transporting, treating, storing, or disposing of hazardous wastes.

The Agency views the section 3010 notification requirements to be necessary in this case because it believes that many persons that manage the wastes coming into subtitle C regulation today have not previously notified EPA and received an EPA identification number.

B. Compliance Dates

1. Interim Status in Unauthorized States

Facilities that currently treat, store, or dispose of the wastes removed from temporary exclusion of this rule, and are characteristically hazardous under 40 CFR part 261, subpart C, but have not received a permit pursuant to section 3005 of RCRA and are not operating pursuant to interim status, may be eligible for interim status under HSWA (see section 3005(e)(1)(A)(ii) of RCRA, as amended). In order to operate pursuant to interim status, such facilities must submit a section 3010 notice pursuant to 40 CFR 270.70(a) by November 30, 1989, and must submit a part A permit application by March 1, 1990. Under section 3005(e)(3), land disposal facilities qualifying for interim status under section 3005(e)(1)(A)(ii) must also submit a part B application and certify that the facility is in compliance with all applicable ground water monitoring and financial responsibility requirements by March 1,

* Under the Solid Waste Disposal Amendments of 1980 (Pub. L. 96-462), EPA was given the option of waiving the notification requirement under section 3010 of RCRA following revision of the section 3001 regulations, at the discretion of the Administrator.

1991. If the facility fails to do so, interim status will terminate on that date.

Completion of final permit application will require individual facilities to develop and compile information on their on-site waste management operations including, but not limited to the following activities: ground-water monitoring (if waste management on land is involved); manifest systems, recordkeeping, and reporting; closure, and possibly, post-closure requirements; and financial responsibility requirements. The permit applications may also require development of engineering plans to upgrade existing facilities. In addition, many of these facilities will, in the future, be subject to land disposal restrictions (LDR) standards. EPA plans to promulgate LDR standards for all characteristic hazardous wastes by May 8, 1990. Under EPA regulations, these standards must require treatment of the affected wastes to a level or by a method that reflects the use of Best Demonstrated Available Technology (BDAT) before the wastes can be disposed on the land. Thus, one future implication of today's final rule will be the ban on land disposal of these wastes unless they are appropriately treated prior to such disposal. (See discussions of the LDR as related to these wastes for further details).

All existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of hazardous wastes covered by today's rule, and that are currently operating pursuant to interim status under section 3005(e) of RCRA, must file with EPA an amended part A permit application by March 1, 1990, in accordance with § 270.72(a).

Under current regulations, a hazardous waste management facility that has received a permit pursuant to section 3005 may not treat, store, or dispose of the wastes removed from temporary exclusion by today's rule and which are characteristically hazardous under 40 CFR part 261, subpart C, when the rule becomes effective on March 1, 1990, until a permit modification allowing such activity has occurred in accordance with § 270.42. EPA has recently amended its permit modification procedures for newly listed or identified wastes. For more details on the permit modification procedures, see 53 FR 37912.

2. Interim Status in Authorized States

Until the State is authorized to regulate the wastes excluded from temporary exclusion by today's rule and which are hazardous under 40 CFR part 261, subpart C, no permit requirements apply and facilities lacking a permit

need not seek interim status. Any facility treating, storing, or disposing of these wastes on or before the effective date of authorization of the State to regulate these wastes under RCRA may qualify for interim status under applicable State law. Note that in order to be no less stringent than the Federal program, the State "in existence" date for determining interim status eligibility may not be after the effective date of EPA's authorization of the State to regulate these wastes. These facilities must also provide the required 3010 notification as described above and must also provide the State's equivalent of a part A permit application as required by authorized State law.

Finally, RCRA section 3005(e)(3) or any authorized State analog will apply to land disposal facilities qualifying for State interim status.

VII. Effect on State Authorizations

This final rule is not effective in authorized States, because its requirements are not being imposed pursuant to the Hazardous and Solid Waste Amendments of 1984. Thus, this removal from temporary exclusion is applicable on March 1, 1990, only in those few States that do not have final authorization to operate their own hazardous waste programs in lieu of the Federal program. In authorized States, the reinterpretation of the regulation of non-excluded processing wastes will not be applicable until the State revises its program to adopt equivalent requirements under State law and receives authorization for these new requirements. (Of course, the requirements will be applicable as a State law if the State law is effective prior to authorization).

States that have final authorization are required (40 CFR 271.21(e)) to revise their programs to adopt equivalent standards regulating non-Bevill mineral processing wastes that exhibit hazardous characteristics as hazardous by July 1, 1991, if only regulatory changes are necessary, or by July 1, 1992, if statutory changes are necessary. These deadlines can be extended by up to six months (i.e., until January 1, 1992, and January 1, 1993, respectively) in exceptional cases (40 CFR 271.21(e)(3)). Once EPA approves the revision, the State requirements become RCRA subtitle C RCRA requirements in that State. States are not authorized to carry out any regulations providing coverage similar to today's proposed rule as RCRA requirements until such regulations (or modifications to regulations) are submitted to EPA and approved. Of course, States with existing standards may continue to

administer and enforce them as a matter of law.

States that submit an official application for final authorization less than 12 months after the effective date of the reinterpretation may be approved without including an equivalent provision (i.e., to address non-Bevill mineral processing wastes) in the application. However, once authorized, a State must revise its program to include an equivalent provision according to the requirements and deadlines provided at 40 CFR 271.21(e).

VIII. Economic Impact Screening Analysis Pursuant to Executive Order 12291

Sections 2 and 3 of Executive Order 12291 (46 FR 13193) require that a regulatory agency determine whether a new regulation will be "major" and, if so, that a Regulatory Impact Analysis (RIA) be conducted. A major rule is defined as a regulation which is likely to result in:

- (1) An annual effect on the economy of \$100 million or more;
- (2) A major increase in costs or prices for consumers, individuals, industries, Federal, State, and local government agencies, or geographic regions; or
- (3) Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Section 8 of Executive Order 12291 exempts an agency from the requirements of the order when compliance would conflict with deadlines imposed by statute or judicial order. As noted in the Preamble to the NPRM for this rule last April (54 FR 15345), time constraints imposed by court-ordered deadlines for publication did not allow the Agency to complete a comprehensive preliminary analysis to evaluate potential economic costs and impacts. At that time, the Agency summarized results from previous work and indicated that, although a complete RIA would not be feasible due to time limitations, additional analysis of costs and impacts would be conducted to evaluate whether this should be considered a major rule. This section of today's preamble summarizes EPA's subsequent screening-level economic impact study.

Today's final rule removes the Bevill exclusion from all smaller volume wastes (less than 45,000 metric tons per year for non-liquid wastes and 1,000,000 metric tons per year for liquid wastes) and high volume wastes that are clearly

not low hazard (based on currently available data) at ore and mineral processing facilities. Therefore, the impacts of today's rule fall within any metal or non-metal commodity sectors generating such waste streams from mineral processing operations, but only to the extent that these wastes exhibit the characteristic tests for hazardous wastes under subtitle C of RCRA.

EPA's impact assessment indicates that today's rule is not a major rule (at least according to criterion 1, above), in that preliminary screening-level estimates place the total annual costs of compliance at about \$53 million per year. Because this is a screening level analysis, however, the level and distribution of impacts is uncertain. It does appear that a few individual mineral commodity sectors or processing technologies could incur annual costs in the range of one to seven percent of their annual value of shipments (sales). These sectors or technologies, though few in number and small in total value of shipments relative to the 101 commodity sectors reviewed in the study, could be said to incur moderate to substantial impacts. Overall, however, with respect to the mineral industry as a whole or the portion of the industry that performs "mineral processing" in particular, the Agency believes, on the basis of its screening analysis, that today's rule does not constitute a major rule within the context of E.O. 12291.

A. General Approach to Compliance Cost Estimation

The purpose of this analysis was to assess the general level of costs and resultant economic impacts arising from the imposition of current subtitle C requirements on smaller volume mineral processing wastes and high volume wastes that are not low hazard that were previously exempt under the Bevill Amendment. As noted above, a complete and detailed examination of the costs and potential impacts of today's rule was not possible given the Court-ordered schedule prompting this rulemaking. The Agency has, however, undertaken a comprehensive screening-level review of all sectors that could be affected directly by today's rule.

EPA's economic screening methodology consisted of a number of straightforward steps designed to (1) identify and describe all mineral processing sectors, (2) characterize and determine the approximate quantities of relevant waste streams, and (3) estimate the subtitle C compliance costs for all sectors generating potentially hazardous wastes. This section briefly describes the approaches and information sources

used to develop these preliminary cost estimates. The following two sections describe the cost estimates and discuss impacts on affected sectors. Additional information concerning the techniques, assumptions, and data sources used in this analysis may be found in a technical background document in the docket for today's rule.⁹

1. Processing Sector Identification

The starting point for the analysis was to identify mineral industry commodity sectors that conduct mineral processing operations within the definition of today's rule. Obviously, facilities in sectors that do not employ such operations will not experience any economic impacts. Working with the U.S. Bureau of Mines, the Agency identified a total of 101 differentiable mineral commodity sectors for initial review. Those specific sectors that employ mineral processing operations were identified by intensive contact with commodity and technical specialists at the U.S. Bureau of Mines, and by consulting outside mineral industry experts particularly knowledgeable of specific industry production techniques and waste management practices. Of the 101 initial sectors, 43 were identified as domestic mineral commodity processing sectors subject to further analysis and review of waste stream characteristics. Of the 58 remaining sectors, 51 commodity sectors were screened out as not conducting processing (i.e., their finished product resulted directly from beneficiation activities). The commodities produced domestically using extraction and beneficiation operations exclusively are listed in appendix A. An additional 7 mineral commodities are not currently processed in the United States. These include arsenic trioxide, cobalt, gallium, graphite, indium, nickel, and thallium.

It is highly noteworthy that the vast majority of mineral commodities listed in appendix A are non-metallic and that only nine of the 43 domestic sectors conducting mineral processing operations produce non-metallic commodities. Thus, the first conclusion that EPA may draw from this screening analysis is that the results from previous cost and impact studies focusing on metallic ore processing sectors are not likely to dramatically underestimate total regulatory compliance costs associated with this rule, as some commenters have persistently claimed.

⁹ USEPA, "Technical Background Document: Development of the Cost, Economic, and Small Business Impacts Arising from the Reinterpretation of the Bevill Exclusion for Mineral Processing Wastes", August 18, 1989.

2. Waste Characterization

The next step was to identify, quantify, and characterize the specific waste streams generated by the 43 identified processing sectors in order to ascertain the extent to which these facilities might be brought into the subtitle C hazardous waste management system. For a few of these sectors, the Agency had past field surveys or sampling data to draw upon, supplemented to some degree by data submitted by commenters in response to previous NPRM's. For the majority of commodity sectors, however, we relied upon technical expertise provided by process engineers experienced in designing and constructing mineral processing facilities and associated waste management systems.

TABLE 3.—MINERAL PROCESSING SECTORS NOT GENERATING POTENTIALLY HAZARDOUS MINERAL PROCESSING WASTES

Antimony ¹
Barite
Bauxite
Beryllium
Boron
Cadmium
Cerium
Cesium/Rubidium
Chromium
Coal Gas
Gemstones
Gold/Silver
Hydrofluoric Acid
Iron
Lightweight Aggregate
Lithium (from ore)
Magnesium (from ore)
Manganese, Ferromanganese
Phosphoric Acid (wet process)
Silicon, Ferrosilicon
Steel
Strontium
Synthetic Rutile
Titanium Dioxide
Zirconium/Hafnium

¹ From pyrometallurgical operations.

For each sector, a brief but systematic review was conducted for the principal or typical processing operation(s), including, for each waste, a waste description, waste generation-to-product ratio estimates, and an assessment of the likelihood of the particular waste exhibiting one or more hazardous waste characteristics. Based upon available information and best professional judgment, 25 of the 43 mineral processing commodity sectors evaluated were found not to generate any solid wastes that are likely to fail characteristic tests for hazard. Because these sectors, which are listed in Table 3, will not suffer economic impacts because of today's final rule, they were not considered further. A total of 18

commodity sectors with 118 facilities were determined likely to generate wastes that may fail hazardous waste characteristic tests. EPA has made every attempt to develop analytical elements (e.g., number of facilities in a given sector) that are directly comparable. Nonetheless, because production data (processes employed, product types, shipment volumes) for some

commodities are not available on a plant-specific basis, the number of facilities identified as generating potentially hazardous wastes does not in all cases correspond to the number of facilities producing a given commodity, because very different production processes may be employed within the same commodity sector. Therefore, the number of facilities contributing to a

sector's aggregate value of shipments and other sector-wide data may differ from the number of facilities predicted to experience compliance costs. In these cases, EPA may have understated the magnitude of economic impacts. Potentially affected sectors, together with the types and quantities of wastes that might be regulated under subtitle C, are presented in table 4.

TABLE 4.—HAZARDOUS WASTE GENERATION BY MINERAL PROCESSING SECTORS

Mineral sector	Process	Hazardous waste type	Facilities generating hazardous waste	Total hazardous waste (MT/year)
Aluminum	Reduction	Casthouse dust	16	13,301
	Reduction	Sludge	13	66,945
	Reduction	Oryolite recovery residue	1	30,000
Antimony	Electrolytic Refining	Stripped anolyte solution solids	1	190
Arsenic	Residuals	Lead dust leachate residue	1	339
Bismuth	Lead-dross refining	Metal chloride residues	1	2,937
Calcium Metal	Retorting	Quicklime	1	43
Copper (Non-Electrowinning)	Smelting	Acid plant blowdown	8	4,399,710
	Smelting/Refining	Sodium hydroxide wastewater treatment plant sludge	1	5,616
	Refining	Bleed electrolyte	8	444,600
Copper (Electrowinning)	Smelting/Refining	Process wastewater	11	530,500
Elemental Phosphorus	Electrowinning slime reduction	Residuals	10	5,400
	Electric furnace	Furnace scrubber blowdown	5	153,000
	Separation	Dust	5	6,446
Ferrochromium	Smelting	Slags and residues	8	181,400
Germanium	Separation	Leachate residue	3	8
Lead	Smelting	Acid plant blowdown	3	350,000
	Smelting	Spent furnace brick	4	530
	Smelting	Slag fines	1	10,400
Magnesium	Electrolytic Refining	Smut	2	21,708
Mercury	McDermitt facility	Furnace calcines	1	11
		Particulate control effluent	1	1,699
		SO ₂ scrubber effluent	1	2,792
Mercury	Byproduct of gold	Dust	9	9
		Furnace residue	9	79
Molybdenic Oxide/Rhenium	Roasting	Gas cleaning effluent solids	2	64
	Roasting	Refining wastes	2	2,335
	Ion Exchange	Rhenium raffinate	2	88,440
Phosphoric Acid	Furnace	Dust slurry	17	7,394
	Furnace	Phosphate contaminated wastewater	17	6,470
Tantalum/Columbium	Digestion	Digester sludge	8	3,707
	Digestion	Raffinate solids	8	7,413
Tin	Smelting	APC scrubber blowdown	1	68,000
Titanium Metal	Sponge	Waste chloride	3	36,484
Zinc	Smelting/Refining	Process wastewater	2	1,451,000
	Smelting/Refining	Acid plant blowdown	3	305,800
	Smelting	Synthetic gypsum	1	16,600
	Smelting/Refining	Wastewater treatment plant sludge	5	45,230
	Electrowinning	Non-saleable residues	2	13,600
Total				8,280,200

3. Compliance Cost Estimation Methods

For this analysis, EPA developed likely waste management scenarios for typical facilities in each sector, addressing both current (baseline) processing waste management practices and waste management options under current subtitle C requirements. Typical practices (at appropriate scales of application) for both baseline and subtitle C compliance scenarios include techniques such as wastewater treatment in tanks, management/disposal in waste piles or landfills, and

shipment for disposal at commercial off-site landfills or treatment facilities. These management scenarios were then implemented through the use of cost engineering functions to compute the incremental compliance costs of today's rule.

The baseline management scenario was developed using knowledge of current practices. The subtitle C compliance scenario was developed based upon existing statutory and regulatory requirements, and assumptions regarding the types of engineering practices that would be

employed to manage individual, newly hazardous wastes under subtitle C. Rather than applying uniform subtitle C assumptions relating to on-site or off-site disposal or assuming that one particular waste disposal practice would be adopted exclusively for all sectors, the Agency designed a tailor-made subtitle C compliance scenario for each waste stream and sector. That is, each waste in each sector was assigned to a sequence of individual waste management techniques appropriate to the physical and chemical characteristics of the material in

question, in such a way as to simulate a minimum cost management practice sequence for that waste type and quantity. In cases where two or more technical options existed for managing a particular waste type, EPA selected the least-cost option for managing a given waste quantity.

For each newly hazardous waste stream, an affected facility would be faced with the choice of constructing subtitle C management units or sending the material off-site for disposal. This decision is influenced by economies of scale; for most types of waste management practices, EPA determined that generators of small quantities would pay for off-site disposal, but generators of larger quantities would construct on-site management units. The waste quantity break points and the data that underlie them are presented in the technical background document for this analysis.

For all potentially hazardous mineral processing wastes in a given sector, EPA calculated baseline and projected subtitle C management costs, at the plant or facility level, for a "model plant" of average commodity processing and waste generating capacity. Results were then extrapolated to develop commodity sector totals, and then further aggregated to 4-digit Standard

Industrial Classification (SIC) industry-wide totals and U.S. nationwide totals. Annual compliance costs represent the sum of annualized charges for capital investments, operating and maintenance expenses, and costs for on-site closure and postclosure responsibilities, where appropriate.

Because this is a screening-level analysis of a very large number of industrial sectors that was conducted during a short period of time, the results of the analysis must be considered somewhat uncertain. While EPA has attempted to obtain complete coverage of all domestic mineral processing activity, the depth of information that the Agency has been able to develop is variable. EPA is confident that it has identified the major processing operations and the major solid wastes associated with them for each commodity sector. The possibility exists, however, that additional waste streams generated by these processing operations may exist and may require management under subtitle C of RCRA. To the extent that this is true, EPA has underestimated the compliance costs of today's rule.

It is important to note, however, that in many respects, EPA used conservative assumptions in conducting this analysis. For example, for many

sectors, the Agency used general engineering or geologic information about the nature and composition of various waste streams to infer whether they would be hazardous, and, if in doubt, adopted the conservative assumption that they would be hazardous. Furthermore, wastes assumed to be or that tested hazardous at one facility were assumed to be hazardous at every facility in that sector using the same or similar processes. EPA also assumed that all affected facilities would be encountering subtitle C requirements for the first time and would therefore not be able to take advantage of scale economies through comanagement of hazardous wastes from other operations (e.g., in addition to mineral processing they may conduct regulated activities that are not covered by Bevill, such as chemical manufacturing).

B. Aggregate and Sector Compliance Costs

EPA's estimate of the total annual cost impact of today's rule is \$52.8 million annually. Predicted sector-wide costs span three orders of magnitude across the various affected commodity sectors. Aggregate and sector-specific cost estimates are presented in table 5.

TABLE 5. SUMMARY OF COSTS IN AFFECTED SECTORS WITH HAZARDOUS PROCESSING WASTES

SIC and sector	Aggregate sector costs (\$)	Number of affected facilities	Cost per affected facility (\$)	Cost/metric ton of mineral (\$/mt) (sector-wide)	Costs/value of shipments (%) (sector-wide)
Minerals:					
2819—Phosphorus, elemental	3,111,000	5	622,200	9.65	0.57
2874—Phosphoric acid (furnace grade)	997,000	17	58,647	1.08	0.17
3313—Ferrochromium	4,711,000	8	588,875	44.02	4.67
3331—Copper—excluding Electrowinning	26,170,000	11	2,379,091	27.04	1.32
3331—Copper—Electrowinning	308,000	10	30,800	2.47	0.12
3332—Lead, including bismuth	2,943,000	4	735,750	7.86	1.09
3333—Zinc	7,620,000	5	1,524,000	28.83	2.70
3334—Aluminum	3,107,000	16	194,188	0.91	0.05
3339—Antimony	11,000	1	11,000	0.61	0.02
3339—Calcium metal	2,000	1	2,000	3.24	0.04
3339—Magnesium	233,000	2	116,500	2.15	0.06
3339—Mercury (excluding gold by-product)	159,000	1	159,000	230.65	2.61
3339—Mercury (by-product of gold)	1,000	9	111	1.14	0.01
3339—Molybdenic oxide and rhenium	1,487,000	2	743,500	70.04	0.88
3339—Tantalum/columbium	513,000	8	64,125	484.21	0.29
3339—Tin	725,000	1	725,000	204.42	2.45
3339—Titanium sponge metal	728,000	3	242,667	39.91	0.42
3339—Arsenic acid	19,000	1	19,000	56.06	7.05
3339—Germanium	0	3	0	0.00	0.00
Total—All affected mineral sectors	52,845,000	1103	513,058	7.91	0.46
Distribution by four-digit SICs:					
2819—Industrial inorganic chemicals, NEC	3,111,000	5	622,200	9.65	0.57
2874—Phosphoric fertilizers	997,000	17	58,647	1.08	0.17
3313—Electro-metallurgical products	4,711,000	8	588,875	44.02	4.67
3331—Primary copper	26,478,000	116	1,654,875	27.04	1.32
3332—Primary lead	2,943,000	4	735,750	7.86	1.09
3333—Primary zinc	7,620,000	5	1,524,000	28.83	2.70
3334—Primary aluminum	3,107,000	16	194,188	0.91	0.05
3339—Primary nonferrous metals, NEC	3,878,000	32	121,188	22.39	0.38

¹ Five electrowinning facilities engage also in non-electrowinning refining processes.

Note: All averages are weighted averages.

These data indicate that nearly half of the total compliance costs will be borne by the primary copper sector, and that affected facilities (16 in total) in the copper and zinc sectors will experience annual compliance costs in excess of \$1 million per facility. In total, 36 of the 103 potentially affected facilities (35 percent) are predicted to experience annual compliance costs of more than \$500,000 per facility.

On the other hand, six commodity sectors will face compliance costs of

less than \$50,000 per affected facility, and almost one-half (50 of 103) of the facilities generating potentially hazardous wastes removed from the Bevill exclusion by today's rule will experience, on average, incremental subtitle C costs of less than \$100,000.

C. Economic Impacts

EPA's screening-level analysis of economic impact compares the magnitude of average compliance costs for each sector to the estimated value of shipments in those sectors. This ratio

provides a first approximation of the extent to which the profitability of firms, or, alternatively, commodity prices, may be adversely affected by the imposition of regulatory compliance costs. In this screening analysis, the Agency grouped commodity sectors into three groups according to the value of compliance costs to value of shipments: Those with ratios below one percent, those between one and five percent, and those with ratios greater than five percent. Results are displayed in Table 6.

TABLE 6. CATEGORIZATION OF MINERAL SECTORS, BY LEVEL OF COMPLIANCE COSTS

Cost category mineral	SIC	Costs/value of shipments (%) (sector-wide)	Number of affected facilities
I. Below 1.0 percent:			
Germanium.....	3339	0.00	3
Mercury (by-product of gold).....	3339	0.01	9
Antimony.....	3339	0.02	1
Calcium metal.....	3339	0.04	1
Aluminum.....	3334	0.05	16
Magnesium.....	3339	0.06	2
Copper—electrowinning.....	3331	0.12	10
Phosphoric acid (furnace grade).....	2874	0.17	17
Tantalum/Columbium.....	3339	0.29	8
Titanium sponge metal.....	3339	0.42	3
Phosphorus, elemental.....	2819	0.57	5
Molybdenic oxide and rhenium.....	3339	0.88	2
Total in category.....			77
II. 1.0–4.9 percent:			
Lead, including bismuth.....	3332	1.09	4
Copper—excluding electrowinning.....	3331	1.32	11
Tin.....	3339	2.45	1
Mercury (excluding gold by-production).....	3339	2.61	1
Zinc.....	3333	2.70	5
Ferrochromium.....	3313	4.67	8
Total in category.....			30
III. 5.0 percent or above:			
Arsenic acid.....	3339	7.05	1
Total in category.....			1

NOTE: 5 copper electrowinning facilities also engage in non-electrowinning processes.

1. Impacts on Commodity Sectors

Twelve mineral sectors comprising 76 percent of the potentially affected facilities will incur compliance costs of less than one percent of their annual value of shipments. These are the germanium, by-product mercury, antimony, calcium metal, aluminum, magnesium, copper from electrowinning, tantalum/columbium, furnace process phosphoric acid, titanium sponge, elemental phosphorus, and molybdenic oxide/rhenium sectors. Of these, only the molybdenic oxide/rhenium commodity sector, with two potentially affected facilities, approaches EPA's one percent

cut-off value for identifying moderate economic impacts.

Seven mineral commodity sectors, with a combined total of 31 facilities, will have compliance costs between one and seven percent of their value of shipments. These include lead/bismuth, copper from processes other than electrowinning, tin, primary mercury, zinc, ferrochromium, and arsenic acid. Only the ferrochromium sector, with eight facilities, and the arsenic acid sector, with one facility, have predicted impacts in excess of three percent of their respective value of shipments.

Sectors with ratios above one percent were considered vulnerable to moderate to significant financial impacts and were evaluated in more detail in terms of market and industry factors that might affect the ultimate incidence and impact of the costs.

To place the results into perspective, EPA examined a number of factors such as absolute price levels, major end uses of the mineral commodity, competition from imports and substitutes, secondary production, and flexibility in other production cost factors.

• *Lead/Bismuth.* (Average cost/sales of 1.1 percent.) Major uses of lead are in

automotive batteries, construction materials, and a wide range of other products. Secondary recovery of lead from used automotive batteries provides a substantial portion of supplies. While marginal substitution is possible in each of the markets, a price increase of 1.4 percent would not substantially alter the basic use patterns of lead. Bismuth is used in a range of pharmaceuticals and chemicals, as well as in manufacturing machine parts. These applications offer a somewhat stable market for bismuth. However, most domestic consumption comes from imports, limiting the potential for domestic suppliers to raise prices.

• **Copper.** (Average cost/sales of 1.3 percent.) Copper is widely used in building construction, electrical and electronic products, industrial machinery and equipment, transportation, and consumer products. The ability of affected firms to raise prices is limited by significant competition from foreign suppliers (some of which are government-supported) and by the wide variety of product substitutes that are available for many copper end uses (e.g., optical fiber in telecommunications cable, plastics in water pipe and plumbing fixtures).

• **Tin.** (Cost/sales of 2.4 percent.) This metal is widely used in coatings, particularly for cans, and alloys in electrical and construction applications. In the coatings business, aluminum, glass, paper, and plastic provide strong competition. Other metals compete in alloy applications. Secondary recovery of tin from scrap is another factor adding to competition. A price increase of 2.4 percent could have a marginal impact on domestic primary tin sales, but may have a significant impact on the one remaining domestic primary tin producer.

• **Mercury.** (Cost/sales of 2.6 percent.) Mercury is used in a number of electrical and chemical applications. Competition is found in the form of different technologies for batteries, process alternatives for electrolytic production of chlorine and caustic soda, substantial supplies of imported mercury, and competition from domestic producers extracting mercury from precious metals side-streams (electrowinning slimes). It is unclear that this facility, which accounts for about 14 percent of domestic production, could recover its compliance costs by increasing prices by 2.6 percent.

• **Zinc.** (Average cost/sales of 2.7 percent.) Zinc is used in die castings and anti-corrosive coatings. In castings, zinc competes with aluminum, plastic, and magnesium. In coatings, plastics, paints, and other alloys offer substitutes. A

major competitive factor is the large share of supply (greater than half) coming from imported slab zinc. These factors would limit the ability of domestic sources of zinc to raise prices.

• **Ferrochromium.** (Average cost/sales of 4.7 percent.) Ferrochromium is used in specialty and high-performance alloys and steels. Its performance characteristics render it valuable to existing users and would mitigate the effects of a price increase of 4.7 percent. Nonetheless, imported supplies of ferrochromium may limit the ability of domestic sources to raise prices.

• **Arsenic Acid.** (Cost/sales of 7.0 percent.) The plant producing arsenic acid from residual lead dust is unlikely to be able to recover compliance costs by raising prices. Arsenic-based wood preservatives and pesticides are valuable to end-users. However, arsenic acid produced from imported arsenious trioxide and imported arsenic acid account for 99 percent of domestic demand. Therefore, the market price for this product are unlikely to change as a result of production cost increases at this single, small facility.

2. Effects on Consumer Prices

Because most, if not all, of the immediate markets for the affected mineral commodities are as inputs to other manufacturing or industrial activities, and because, as discussed in the previous section, the ability of firms in most affected sectors to pass through compliance costs appears to be limited, EPA believes that, in general, this rule will not create any appreciable changes in consumer prices.

3. Foreign Trade Impacts

Trade is substantial in many of the mineral commodities addressed in this study. Basic import and export data for the sectors that generate potentially hazardous wastes are presented in Tables 7 and 8, respectively. Export markets are generally small for the commodities that EPA has identified as having moderate to significant compliance cost impacts (i.e., cost/value of shipments of one percent or more), and these markets may be adversely affected by the predicted economic impacts of compliance.

TABLE 7. IMPORTS OF MINERALS PRODUCED IN SECTORS GENERATING HAZARDOUS WASTES, 1987

Mineral and categories ¹	Quantity (MT)	Value (\$000)
Aluminum—metal	1,245,510	1,852,152
Antimony—metal	9,701	18,171
Arsenic—compounds	1,540	NA

TABLE 7. IMPORTS OF MINERALS PRODUCED IN SECTORS GENERATING HAZARDOUS WASTES, 1987—Continued

Mineral and categories ¹	Quantity (MT)	Value (\$000)
Bismuth—metals and alloys (gross weight)	1,580	8,769
Calcium	352	1,918
Columbium—ore	2,078	6,612
Copper—refined in ingots, etc.	469,181	734,725
Ferrochromium—Ferrochromium and ferrochromium-silicon	302,948	155,189
Germanium—unwrought waste and scrap (gross weight)	15	7,987
Lead—base bullion (lead content)	10,827	7,239
Magnesium—metal	10,884	NA
Mercury—metal	636	3,860
Molybdenum—compounds (gross weight)	3,044	13,407
Rhenium—metal, including scrap	3	2,072
Phosphoric acid	NA	NA
Phosphorus, elemental	4,000	6,609
Tantalum—ore	316	5,186
Tin—metal—bars, blocks, pigs, or granulated	41,150	259,699
Titanium—unwrought sponge metal	923	6,321
Zinc—blocks, pigs, and slabs	705,985	581,221

¹ Categories for data on trade do not necessarily correspond to the mineral sectors that involve processing.

Sources: U.S. Bureau of Mines, Minerals Yearbook 1987 and Mineral Commodities Survey 1989.

TABLE 8.—EXPORTS OF MINERALS PRODUCED IN SECTORS GENERATING HAZARDOUS WASTES, 1987

Mineral and categories ¹	Quantity (MT)	Value (\$000)
Aluminum—ingots, slabs, crude	281,163	415,003
Antimony—metals and alloys, crude	795	2,817
Arsenic—compounds	167	NA
Bismuth—metals and alloys	38	641
Calcium—metal	NA	NA
Columbium	NA	NA
Copper—refined copper and semi-manufactured	114,721	427,843
Ferrochromium	4,535	5,730
Germanium	NA	NA
Lead—pigs, bars, cathodes, sheets, etc.	10,116	11,945
Magnesium—metal and alloys, scrap, semi-manufactured	44,151	130,672
Mercury	NA	NA
Molybdenum—compounds (molybdenum content)	1,223	11,146
Rhenium	(²)	(²)
Phosphoric acid—type not specified	500,000	85,912
Phosphorus, elemental	20,302	30,796
Tantalum—ore, metal, other forms; powder	276	34,794
Tin—ingots, pigs, bars, etc.	1,318	9,456
Titanium—unwrought sponge metal	85	746
Zinc—slabs, pigs, and blocks	1,082	2,114

¹ Categories for data on trade do not necessarily correspond to the mineral sectors that involve processing.

² Negligible.

Sources: U.S. Bureau of Mines, Minerals Yearbook: 1987 and Mineral Commodities Survey 1989.

Because imports of many of the mineral commodities in question are significant, the ability of domestic producers to raise prices to recover compliance costs, is, as discussed above, quite limited. A direct comparison of processed domestic minerals with imports is difficult because of the presence of imports in the form of both base metals and other assorted compounds and manufactured products. Nonetheless, using the import figures in table 8 as one measure of the scale of imports, the international trade situation facing the firms in the commodity sectors that will experience cost impacts above the one percent level can be summarized as follows:

- Imports account for a relatively low percentage of domestic demand for lead and for moderate shares of copper and mercury;
- Imports exceed processed domestic production in the tin, zinc, and ferrochromium sectors; and
- Trade data for arsenic acid are difficult to quantify; imports of arsenious trioxide (an intermediate in the production of arsenic acid) are substantial.

In view of the above, it is unlikely that the overall trade balance in the domestic minerals industry will be significantly affected by today's rule, though in some sectors regulatory cost impacts may increase already positive net imports.

IX. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA) of 1980 (Pub. L. 96-354), which amends the Administrative Procedures Act, requires Federal regulatory agencies to consider "small entities" throughout the regulatory process. The RFA requires, in section 603, an initial screening analysis to be performed to determine whether a substantial number of small entities will be significantly affected by a regulation. If so, regulatory alternatives that eliminate or mitigate the impacts must be considered.

Section 608 of the Act allows an Agency head to waive or delay completion of the screening analysis in response to an emergency that makes compliance with the requirements of section 603 on a timely basis impracticable. In previous NPRMs to this rule, the Agency indicated that there was insufficient time within the Court-ordered deadline to complete a comprehensive impact screening for

small business impacts, but that, based on previous analyses for metallic metals processing and general knowledge of waste characteristics in non-metals processing, it was probable that there would not be significant small business impacts from this rulemaking (54 FR 15347).

The Agency has now completed a comprehensive screening analysis to determine the potential for significant small business impacts, as described below. Based upon this subsequent analysis, the Agency has concluded that today's final rule will not have a significant adverse impact on a substantial number of small mineral processing companies. With very few exceptions, as indicated below, the commodity sectors with moderate to substantial predicted cost/economic impacts contain either few or no small business enterprises.

A. Definition of Affected Small Entities

Today's rule has its primary direct effects on ore and mineral processing facilities that generate wastes that could fail any of the Agency's tests for hazardous waste characteristics. To the best of the Agency's ability within the time constraints of this Court-ordered final rule, the mineral commodity sectors most likely to face subtitle C compliance costs have been identified in section VIII of this preamble, based on EPA's screening study of cost and economic impacts. Eighteen commodity sectors falling within eight 4-digit SIC codes represent the population of affected business firms (see table 6, above).

For purposes of defining "small business" firms, EPA has relied on the standard definitions of the Small Business Administration (SBA) as published at 13 CFR ch. 1, part 121. For the industries in question, SBA employs a basic employment-based definition, with the small business cut-off value for total company employment ranging between 500 and 1,000 employees, depending upon the specific industry in question.

B. Approach and Data Sources

Based upon the results of the economic impact screening analysis described above in section VIII, EPA conducted a comprehensive RFA business ownership screening analysis for those mineral commodity sectors estimated to incur moderate to significant economic impacts associated with today's rule. While it was not possible in the cost analysis to develop compliance cost estimates specific to different sizes of facilities within each affected mineral sector, all potentially

affected small businesses were identified individually. Comparative data were then available to evaluate (a) how many small businesses operate in the mineral sectors predicted by the economic impact screening analysis to be significantly affected and (b) what fraction of the overall small business population in the minerals processing-related industry categories (SICs) might be affected by subtitle C requirements pursuant to this rule.

Working largely with U.S. Bureau of Mines mineral commodity specialists and file data, each of the facilities engaged in affected mineral sectors was identified by name and location. If the facility was owned by a separate parent company, that company was identified using either the Directory of Corporate Affiliations¹⁰ or the Trinet Data Base.¹¹ Thus, for each sector EPA determined the total number of businesses owning facilities. The Agency then determined the number of employees in each business using one of four sources: Standard and Poor's Corporate Records,¹² Ward's Business Directory,¹³ the Trinet Data Base, or phone contacts. Employment figures for public companies were determined using Standard and Poor's Corporate Records. Ward's Business Directory provided employee figures for many of the larger private businesses and the Trinet Data Base identified employee numbers for many of the smaller private businesses. For the small number of businesses that did not appear in any of these sources, the Agency contacted the business by phone to obtain employee information. For all but three of the facilities in the 18 affected mineral commodity sectors, the Agency was able to determine the size of the owner company.

EPA obtained the appropriate SIC classification for each affected sector from the Department of Commerce. The Agency then compared the employee estimates to the Small Business Administration's (SBA's) definition of a small business for the sector's SIC code and determined the number of small and large businesses in that sector. SBA defines small businesses as less than 1,000 employees or less than 750

¹⁰ National Register Publishing Company, "Directory of Corporate Affiliations" (Wilmette, IL: 1988).

¹¹ Trinet Company Database, Trinet Inc. (Parsippany, NJ: 1988).

¹² Standard and Poor's Corporation, "Standard and Poor's Corporation Records" (New York, New York: 1988).

¹³ Information Access Company, "Ward's Business Directory, Volume 1, US Private Companies, Largest Private Plus Selected Public Companies" (Belmont, CA: 1988).

employees for most of the SIC codes.¹⁴ Results of this analysis are displayed in appendix B to today's preamble.

The Agency also classified the number of affected small businesses by SIC code, then compared this to the total number of small businesses in that SIC code, based on SBA estimates of the total number of small businesses in each SIC code. EPA also computed the percentage of the total number of firms within a given 4-digit SIC code accounted for by affected small businesses and affected small and undefined businesses. Appendix C to today's preamble displays the results of this analysis.

C. Results

From the cost analysis, facilities and companies in 18 mineral commodity sectors within eight 4-digit SIC industries would be subjected to regulatory compliance costs by today's rule. The sectors were previously grouped by level of impact in Table 6. Of the 18 sectors evaluated for economic impact, seven sectors—lead/bismuth, copper from operations other than electrowinning, tin, primary mercury, zinc, ferrochromium, and arsenic acid—have potential average compliance costs greater than one percent of value of shipments (sales) and could therefore be considered to face moderate to substantial impacts for affected firms. Lead/bismuth, tin, mercury (in terms of the one affected facility), and arsenic acid have no small business operations. Only zinc (with one small company), ferrochromium (with three small firms), and possibly copper (with one firm of

unknown size), therefore represent affected sectors of concern with respect to small business impacts, with a combined total of four or five small business companies. Supporting data for these findings are presented in appendix C to this preamble.

Taken together, the number of small businesses in these two or three sectors represents a very small fraction of the total number of small businesses in the relevant mineral processing industries.

Based upon this screening analysis, the Agency concludes that there will not be a significant adverse impact on a substantial number of small mineral processing companies as a result of this rulemaking.

List of Subjects in 40 CFR Part 261

Hazardous waste, Waste treatment and disposal, Recycling, Reporting and recordkeeping requirements.

Dated: August 18, 1989.

F. Henry Habicht,

Acting Administrator.

Appendix A—Mineral Commodities Produced by Beneficiation Operations

Commodity sector	Sources
Ammonium paratungstate	(A)
Asbestos	(A)
Asphalt, natural	(A)
Boron (from brines)	(A, B)
Bromine (from brines)	(A)
Clay	(A, B)
Coal	(A)
Diatomite	(A)
Emery	(A)
Feldspar	(A)
Fluorspar	(A)

Commodity sector	Sources
Garnet	(A, B)
Gilsonite	(A)
Glauconite (greensand)	(A)
Gypsum	(A)
Ilmenite	(A)
Iodine (from brines)	(A)
Kyanite	(A)
Limestone/Lime	(A)
Lithium (from brines)	(A, C)
Magnesia	(A)
Mica	(A)
Mineral waxes	(A)
Olivine	(A)
Peat	(A)
Perlite	(A)
Phosphate	(A)
Platinum group metals	(A)
Potash	(A)
Pumice	(A)
Pyrobitumens	(A)
Pyrophyllite	(A)
Flare Earths	(A, B)
Rutile	(A)
Salt	(A)
Sand and gravel	(A)
Scandium	(A)
Silica sand	(A)
Soda ash	(A)
Sodium sulfate	(A)
Staurolite	(A, B)
Stone, crushed	(A)
Stone, dimension	(A)
Sulfur	(A)
Talc	(A)
Tripoli	(A, B)
Vanadium	(A)
Vermiculite	(A)
Wollastonite	(A, B)
Zeolites	(A, B)
Total beneficiation sectors	50

Sources:
(A)—Bureau of Mines (Commodity Specialists, 1987 Mineral Yearbook, 1985 Mineral Facts and Problems).
(B)—Kaiser Engineers, Inc., 1989, See Technical Background Document for this Rulemaking.
(C)—Charles River Associates, 1989, See Technical Background Document for this Rulemaking.

APPENDIX B—COMPANIES IN MINERAL PROCESSING SECTORS AFFECTED BY TODAY'S RULE BY SBA SIZE CATEGORY

SIC code and mineral commodity	SBA definition of a small business (maximum employment)	Number of large businesses	Number of small businesses	Number of businesses of unknown size	Number of total businesses	Percent small	Percent small or unknown
2819—Phosphorus, elemental	1,000	4	0	0	4	0	0
2874—Phosphoric acid, FG	500	5	1	0	6	17	17
3313—Ferrochromium	750	5	3	0	8	38	38
3331—Copper	1,000	10	0	1	11	0	9
3332—Lead	1,000	2	0	0	2	0	0
3333—Zinc	750	3	1	0	4	25	25
3334—Aluminum	1,000	10	1	0	11	9	9
3339—Arsenic	750	1	0	0	1	0	0
3339—Antimony	750	5	4	0	9	44	44
3339—Bismuth	750	1	0	0	1	0	0
3339—Calcium	750	1	0	0	1	0	0
3339—Germanium	750	2	0	1	3	0	33
3339—Magnesium	750	2	0	0	2	0	0
3339—Mercury/gold	750	6	3	1	10	30	40
3339—Rhenium/molybdenic oxide	750	2	0	0	2	0	0
3339—Tantalum/columbium	750	6	2	0	8	25	25

¹⁴ SBA does not distinguish between businesses that employ more than 500 and less than 1,000 persons, i.e., it is not possible to determine how

many businesses employ less than 750 people using SBA data. In the case of SIC categories in which 750 employees is the small business cut-off value, EPA

used the SBA figures for businesses with less than 1,000 employees. The actual number of small businesses for those SIC categories may therefore be less.

APPENDIX B—COMPANIES IN MINERAL PROCESSING SECTORS AFFECTED BY TODAY'S RULE BY SBA SIZE CATEGORY—Continued

SIC code and mineral commodity	SBA definition of a small business (maximum employment)	Number of large businesses	Number of small businesses	Number of businesses of unknown size	Number of total businesses	Percent small	Percent small or unknown
3339—Tin.....	750	1	0	0	1	0	0
3339—Titanium sponge.....	750	2	1	0	3	33	33
Subtotal for SIC.....		29	10	2	41	24	29
Total—above minerals.....		68	16	3	87	18	22

APPENDIX C—AFFECTED SMALL BUSINESS MINERAL PROCESSORS AS A PERCENT OF SMALL BUSINESSES IN EACH INDUSTRY CATEGORY

SIC code and industry category description	SBA definition of a small business (maximum employment)	Total small businesses in SIC category ¹	Affected mineral processing businesses—			
			Affected small businesses	Affected businesses—unknown size	Affected small businesses/total small businesses (percent)	Affected small and unknown businesses/total small businesses (percent)
2819—Industrial inorganic chemicals, N.E.C.....	1,000	885	0	0	0.0	0.0
2874—Phosphatic fertilizers.....	500	91	1	0	1.1	1.1
3313—Electro-metallurgical products.....	750	34	3	0	8.8	8.8
3331—Primary copper.....	1,000	2	0	1	0.0	50.0
3332—Primary lead.....	1,000	17	0	0	0.0	0.0
3333—Primary zinc.....	750	13	1	0	7.7	7.7
3334—Primary aluminum.....	1,000	43	1	0	2.3	2.3
3339—Primary nonferrous metals, NEC.....	750	184	10	2	5.4	6.5
Total—Above SIC categories.....		1,269	16	3	1.3	1.5

¹ The Small Business Administration (SBA) provided the estimates of the total number of small businesses within each SIC category. SBA does not distinguish between businesses that employ more than 500 and less than 1,000 persons, i.e., it is not possible to determine how many businesses employ less than 750 people using SBA data. In the case of SIC categories in which 750 employees is the small business cut-off value, EPA used the SBA figures for businesses with less than 1,000 employees. The actual number of small businesses for those SIC categories may therefore be less.

For the reasons set out in the preamble, part 261 of title 40 of the Code of Federal Regulations is amended as follows:

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTES

1. The authority citation for part 261 continues to read as follows:

Authority: (42 U.S.C. 6905, 6912(a), 6921, and 6922).

2. Section 261.3 is amended by revising paragraphs (a)(2) (i) and (iii) to read as follows:

§ 261.3 Definition of hazardous waste.

(a) * * *

(2) * * *

(i) It exhibits any of the characteristics of hazardous waste identified in subpart C except that any mixture of a waste from the extraction, beneficiation, and processing of ores and minerals excluded under § 261.4(b)(7) and any other solid waste exhibiting a characteristic of hazardous waste under subpart C of this part only if it exhibits a characteristic that would not have been exhibited by the excluded waste alone if such mixture had not occurred or if it continues to exhibit any

of the characteristics exhibited by the non-excluded wastes prior to mixture. Further, for the purposes of applying the Extraction Procedure Toxicity characteristic to such mixtures, the mixture is also a hazardous waste if it exceeds the maximum concentration for any contaminant listed in table I to § 261.24 that would not have been exceeded by the excluded waste alone if the mixture had not occurred or if it continues to exceed the maximum concentration for any contaminant exceeded by the nonexempt waste prior to mixture.

(iii) It is a mixture of a solid waste and a hazardous waste that is listed in subpart D of this part solely because it exhibits one or more of the characteristics of hazardous waste identified in subpart C, unless the resultant mixture no longer exhibits any characteristic of hazardous waste identified in subpart C of this part or unless the solid waste is excluded from regulation under § 261.4(b)(7) and the resultant mixture no longer exhibits any characteristic of hazardous waste identified in subpart C of this part for

which the hazardous waste listed in subpart D of this part was listed.

* * * * *

2. Section 261.4 is amended by revising paragraph (b)(7) to read as follows:

261.4 Exclusions.

* * * * *

(b) * * *

(7) Solid waste from the extraction, beneficiation, and processing of ores and minerals (including coal), including phosphate rock and overburden from the mining of uranium ore. For purposes of this paragraph, beneficiation of ores and minerals is restricted to the following activities: crushing, grinding, washing, dissolution, crystallization, filtration, sorting, sizing, drying, sintering, pelletizing, briquetting, calcining to remove water and/or carbon dioxide, roasting in preparation for leaching (except where the roasting/leaching sequence produces a final or intermediate product that does not undergo further beneficiation or processing), gravity concentration, magnetic separation, electrostatic separation, floatation, ion exchange, solvent extraction, electrowinning,

precipitation, amalgamation, and heap, dump, vat, tank, and *in situ* leaching. For the purposes of this paragraph, solid waste from the processing of ores and minerals includes only:

(i) The following solid wastes from the processing of ores and minerals that are retained within this exclusion:

(A) Slag from primary copper smelting;

(B) Slag from primary lead smelting;

(C) Red and brown muds from bauxite refining;

(D) Phosphogypsum from phosphoric acid production;

(E) Slag from elemental phosphorus production; and

(ii) The following solid wastes from the processing of ores and minerals that are conditionally retained within this exclusion, pending collection and evaluation of additional data:

(A) Roast/leach ore residue from primary chromite production;

(B) Gasifier ash from coal gasification;

(C) Process wastewater from coal gasification;

(D) Slag tailings from primary copper smelting;

(E) Calcium sulfate wastewater treatment plant sludge from primary copper smelting/refining;

(F) Furnace off-gas solids from elemental phosphorus production;

(G) Fluorogypsum from hydrofluoric acid production;

(H) Process wastewater from hydrofluoric acid production;

(I) Air pollution control dust/sludge from iron blast furnaces;

(J) Iron blast furnace slag;

(K) Process wastewater from primary lead production;

(L) Air pollution control dust/sludge from lightweight aggregate production;

(M) Process wastewater from primary magnesium processing by the anhydrous process;

(N) Process wastewater from phosphoric acid production;

(O) Basic oxygen furnace and open hearth furnace slag from carbon steel production;

(P) Basic oxygen furnace and open hearth furnace air pollution control dust/sludge from carbon steel production;

(Q) Sulfate processing waste acids from titanium dioxide production;

(R) Sulfate processing waste solids from titanium dioxide production;

(S) Chloride processing waste solids from titanium tetrachloride production; and

(T) Slag from primary zinc smelting.

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