Appendix E

Draft Analysis Plan for the FY2006 HUDQC Study

Quality Control for Rental Assistance Subsidy Determinations

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INTRODUCTION

The purpose of this document is to describe how analyses will be conducted for the FY2006 HUD-QC Study: Quality Control For Rental Assistance Subsidy Determinations. The Department of Housing and Urban Development (HUD) provides housing assistance through several rental assistance programs. Subsidies are based on HUD regulations defining financial need, eligibility requirements, and subsidy amounts. Generally, eligibility for a HUD-assisted housing unit requires a total income equal to or below the very-low-income standard (50% of the median family income of the area). The tenant payment is set at the higher of two amounts: 10 percent of total income, or 30 percent of adjusted income, based on certain types of deductions.

This study examines the following rent subsidy programs:

- PIH-administered Public Housing (i.e., Public Housing)
- PIH-administered Section 8 projects
  - Moderate Rehabilitation
  - Vouchers
- Office of Housing-administered projects (i.e., owner-administered)
  - Section 8 New Construction/Substantial Rehabilitation
  - Section 8 Loan Management
  - Section 8 Property Disposition
  - Section 202 Project Rental Assistance Contracts (PRAC)
  - Section 202/162 Project Assistance Contracts (PAC)
  - Section 811 PRAC

The HUD QC Study focuses on the nature and extent of errors in rental assistance subsidies in the assisted housing programs listed above. The overall purpose of the study is to determine the type, severity, and cost of errors associated with income certification and rent calculations. This study will produce national estimates of error in each program. A nationally representative sample of 2,400 tenants in approximately 600 projects nationwide will be selected for review and verification of information used to determine rental assistance subsidies in their most recent (re) certification.1 In order to conduct this review and verification, we will execute the following steps:

1. **Review Tenant File.** ORC Macro staff will use computer-assisted data collection technology to review and extract information contained in each sampled tenant's file. The focus of the review is HUD's forms 50058 and 50059 which are used by housing managers to record information required for determining rental assistance eligibility and subsidy amount; and the specific pieces of information contained in the file that are used by

[1] The timing of the verification information is a key aspect of the study. This study seeks to verify information as of the most recent (re)certification, or in the absence of a (re)certification, to verify information when the (re)certification was due. If the (re)certification is more than one year overdue, verification will be obtained for the month the recertification would have been effective if it had been completed on time. The fact that the study is being conducted after the (re)certification has occurred, requires more attention to obtaining accurate reports and verifications than would be needed if the study was done at the time of (re)certification. In order for the study to represent the population of tenants, it is necessary to select all tenants with equal probability, even if it means that their most recent (re)certifications were performed up to a year before.

management to verify the figures used in the 50058 or 50059. The 50058/9 forms also contain the rent calculated by management.

2. **Determine Procedural Errors.** Using the information in the tenant file, ORC Macro will re-calculate the rent on the basis of verification documentation and information contained in the file. Discrepancies between the rent recorded on the 50058/59 and this recalculation will indicate procedural errors.

3. **Interview Tenants.** Each tenant will participate in a detailed item by item interview, capturing each element in the rent calculation. This interview will probe on all financial resources and household circumstances, including those that may not be contained in the tenant file. Tenants will be asked to sign releases permitting ORC Macro to obtain verification from relevant third parties for items lacking verification documentation in the tenant file.

4. **Conduct Enhanced Verification.** Based on new or more accurate information provided by the tenant, ORC Macro will record and then obtain verification from third parties of the amounts reported. In addition, verification of benefits and earned income will be obtained directly from official Federal-level sources by matching household member identifying information (name, Social Security number, date of birth) with Social Security Administration files and the National Directory of New Hires.

5. **Calculate QC Rent.** A rent calculation will be performed on the basis of verified information, including that contained in the original tenant file and that obtained through the interview process and third party verification.

6. **Determine Error.** Errors are defined as the difference between the rent calculation on the 50058/59 and rent determined by the QC rent calculation.

Using the data collected in the above steps and the error determinations, the data analysis will proceed to address the study's objectives.

THE DEPENDENT VARIABLE

The dependent variable in this study has several dimensions and definitions. At a very basic level, an error pertains to the condition in which a tenant is receiving an incorrect amount of subsidy, based on verified information.

Rent Used in Error Determinations. Error is determined by the difference between the rent actually paid by the tenant and the rent that should have been paid, based on verified information obtained by the HUD-QC study:

- **Actual Rent—**the monthly rent indicated on the 50058/9 forms or, if this item was missing, this information is obtained from other sources in the tenant file. This is the monthly rent for the year to follow the most recent (re)certification.
- **Quality Control (QC) Rent—**the monthly rent calculated by ORC Macro using the information reported by the household and verified, if possible, as well as the verified information contained in the tenant file.

Calculation of Quality Control Rent. HUD specifies the formulas for determining tenant rents for each of its programs. These formulas generally consider adjusted annual income, which is the total of household members' earned and unearned income, less specific allowances. There are several different calculation formulas, depending on the program and the specifics of each tenant's situation. These formulas are defined in the HUD-QC Study ***Standards*** document delivered under separate cover.

Error Definitions. Study objectives require that several different types of errors be estimated on the basis of data collected in this study. The two primary distinctions are total errors and error rates.

Total Errors

- **Dollar Rent Error—**the dollar amount of Actual Rent minus QC Rent for an individual tenant. A negative number indicates an underpayment, meaning the household paid less than it should and HUD's subsidy was higher than it should have been. A positive number indicates a household overpayment, meaning HUD's contribution was less than it should have been.
- **Total Gross Rent Error—**the weighted sum of the absolute values of positive and negative individual tenant Rent Dollar Errors.
- **Total Net Rent Error—**the arithmetic value of the weighted sum of individual tenant Rent Dollar Errors.

Error Rates

- **Dollar Error Rate—**the quotient of Total Gross Rent Error divided by the weighted sum of individual tenant QC rents.
- **Case Error Rate—**the quotient of the weighted sum of Dollar Rent Errors in excess of $5 per month divided by the total weighted number of tenants.

Errors in rental assistance subsidies relate to both eligibility and amount of subsidy:

- **Eligibility Error—**a tenant may not be eligible, which places the entire subsidy in error.[2]
- **Subsidy Error—**the amount of subsidy may be too high or too low.

Error sources are classified into two broad types:

- **Rent Component Error—**any of the components used to determine rent (e.g., earned income, household size, medical expenses) could be in error. These are often attributed to tenant misreporting, but they can also be due to misunderstanding.
- **Procedural Error—**local housing administrative staff may make mistakes (e.g., calculation errors, transcription errors, improper application of income or allowances) or they may fail to follow HUD requirements (e.g., fail to recertify on time). Some procedural errors (e.g., not requesting a Social Security number) do not produce rent errors.

[2] Eligibility is determined at the time of initial certification; therefore, eligibility errors will be assessed only for certifications, not recertifications.

Errors may be made in either the determination of initial eligibility or in the determination of the correct tenant payment. Two types of payment errors may occur:[3]

- **Overpayment—**tenant payment is above the correct amount, and HUD's subsidy is too low.
- **Underpayment**—tenant payment is below the correct amount, and HUD's subsidy is too high.

Appendix A contains the definitions of all key terms used in this analysis plan.

PREPARATION OF ANALYTIC FILES

The main analytic files will be based on the results of tenant file reviews, tenant interviews, and third party verification. While we will be using the third party verified information to determine errors, the analytic files must also contain the information collected from the tenant files and tenant interviews to address the study objectives pertaining to error sources and causes. The tenant file information is needed to identify the incidence of procedural errors; the tenant interview data is needed to determine the incidence of tenant misreporting; both files and the verification file are needed to determine the extent that various types of resources contribute to error.

Our core master analytic file will consist of a tenant record containing:

Tenant Record Review Data—all information collected from the 50058/9, the items that are verified and the type of verification observed; and the tenant rent.

Tenant Interview Data—all information collected during the tenant interview pertaining to items needed to calculate rent and determine eligibility.

QC Verification Data—all information used to calculate the QC rent, consisting of verified information obtained from third parties, information provided by the tenant, and verified information obtained from the tenant file.

We will construct a series of analytic files to address the research questions, using the data in the master analytic file. Error values (as defined by the methods described above) will be calculated and appended to the main analytic file, and identify discrepancies and dollar differences between the three sources of tenant data listed above. Additional variables will be constructed, including error type (e.g., transcription, calculation). Weights equal to the inverse of the sampling fractions will be appended so that national estimates can be produced. Variance estimates will be produced using a replication or Taylor series procedure.

We will use two additional data sources. One of the study objectives is to determine whether tenant data entered into TRACS/PIC has associated QC errors. Another objective is to determine whether errors can be predicted from tenant and project characteristics. To obtain information on housing project characteristics, we conduct a survey of local housing managers from which we obtain information on characteristics of the housing project and management practices. We will create separate analytic files to conduct the analyses associated with these two data sets. Relevant tenant

[3] It is possible that the result may produce no error in rent payment or subsidy amount. Some errors may "cancel" others out, or the individual items may not be of sufficient magnitude to have an effect on rents or subsidies.

information will be appended to the project survey file. The study sample will be matched with TRACS/PIC, and the 50058/9 data from TRACS/PIC will be appended to the tenant data for analysis.

ANALYSIS PLAN BY STUDY OBJECTIVE

This section of the Analysis Plan discusses the study objectives and describes the analysis that will address each objective. Appendix B contains a summary of the objectives and the source tables that address each objective. Appendix C contains shells for the source tables. Source tables will be used to produce the analytic exhibits displayed in the body of the report. We describe specific analytic exhibits and provide shells for these in the discussion below.

Objective 1: Identify the various types of rent errors and rent error rates and their variance estimates.

This objective requires us to identify types of errors and produce national estimates of the proportion of tenant cases with errors, along with associated variance estimates. These errors include the percent of households paying correct and incorrect rent, average dollar rent error, and dollar error rate. Analyses will cross-tabulate national estimates to produce a series of tables as described below. To assure comparability with prior studies, the tabular displays will follow the previously used formats and will include FY2005 study results alongside the FY2006 study results. Variance estimates are displayed in tables discussed under Objective 3.

Exhibit 1 illustrates how we will display the percent of households with proper payments. It provides the national estimate of the proportion of tenants whose QC rent is exactly equal to the Actual Rent, and the proportion within $5 of an exact match. This exhibit also provides a comparison between FY2005 and FY2006 results, and a comparison of results for by program type.

Exhibit 1
Percent of Households with Proper Payments (FY2005 and FY2006)

Program Type	Percent Matched Within $5		Percent Matched Exactly	
	FY2005	FY2006	FY2005	FY2006
Public Housing				
PHA-administered Section 8				
Total PHA-administered				
Total Owner-administered				
Total				

Source Tables 1a and 1b

Exhibit 2 provides further information on the tenant error rate, displaying the average dollars in error and gross dollar error rate for the total population in PHA-administered and owner-administered projects. It compares the FY2005 results with the FY2006 results. Gross dollars in error for FY2004 will be calculated using actual FY2004 dollars.

Exhibit 2
Rent Error: Percent of Households in Error, Average Gross Dollars in Error, and Error Rate
(FY2005 and FY2006)

Program Type	Percent of Households in Error		Average Gross Dollars in Error		Gross Dollar Error Rate	
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
Public Housing						
PHA-administered Section 8						
Total PHA-administered						
Total Owner-administered						
Total						

Source Tables 1a and 2

Exhibits 3a and 3b display the dollar amount of error associated with tenant over- and under-payments. Exhibit 3a displays the percent of households paying less than the proper amount and the average dollar underpayment error. Exhibit 3b displays the same information for households paying more than the proper amount.

Exhibit 3a
Underpayment Households: Percent of Households and Average Monthly Dollar Amount of Error
(FY2005 and FY2006)

Program Type	Percent of Households with Underpayment		Average Dollar Error for Households with Underpayment	
	FY2005	FY2006	FY2005	FY2006
Public Housing				
PHA-administered Section 8				
Total PHA-administered				
Total Owner-administered				
Total				

Source Tables 1b and 3

Exhibit 3b
Overpayment Households: Percent of Households and Average Monthly Dollar Amount of Error (FY2005 and FY2006)

Program Type	Percent of Households with Overpayment		Average Dollar Error for Households with Overpayment	
	FY2005	FY2006	FY2005	FY2006
Public Housing				
PHA-administered Section 8				
Total PHA-administered				
Total Owner-administered				
Total				

Source Tables 1b and 3

Objective 2: Identify the dollar costs of various types of error.

Previous QC studies identified several types of error that can be detected using information in the tenant file. These errors are identified using data obtained from the 50058/59 directly as it appears on the 50058/59 form, and other information from files used to determine which information should be recorded on the 50058/59. Procedural errors are detectable through the analysis of the tenant file data, and may or may not result in rent errors. This analysis will not use QC rent error as a standard because the QC rent will be based on information obtained during the tenant interview as well as verification obtained from third parties.

Calculation errors are detected by recalculating section subtotals and final rent based on the exact information in the 50058/59 forms. The rent will be calculated using the detailed information on the 50058/59 and compared to the tenant rent on the 50058/59. If the two rents differ, this indicates a calculation error.

Consistency errors are identified by assessing the logical conformity between elements within the 50058 or 50059 forms. For example, assistance status information must correspond (e.g., elderly status) must be consistent with other information (e.g., age of the head of household or spouse).

Transcription errors are detected by comparing 50058/59 data with information obtained from the tenant file. As the data are entered, the automated data entry system compares the subtotals in each section of the 50058/59 forms. If the 50058/59 data do not match the tenant file data, the system alerts data collectors to a possible transcription error. The data collectors will then that confirm the data were entered correctly.

The improper application of allowances and incorrect calculation of income are a subset of transcription errors. Failure to apply allowances correctly and identify income correctly will be identified by comparing tenant file information to 50058/59 data. Allowance errors will be detected by calculating the allowances based on the tenant file and comparing this QC allowance to the Actual Allowance on the 50058/59. Similarly, income will be calculated based on the types and amounts of income reported in the tenant file.

A series of exhibits will display errors detected in tenant file data. Exhibit 4 presents the percent of households with calculation and consistency errors in different sections of the 50058 and 50059 forms. More detailed data will be presented in Source Tables 4 (calculation errors) and 5 (consistency errors). Note that the 50058 form is formatted differently and in some sections provides more line items of information than the 50059 form. Consequently, the number and types of calculation and consistency errors on the forms will be different, and the findings from the two forms will not be comparable.

Exhibit 4
Percent of Households with Calculation and Consistency Errors (FY2006)

50058/50059 Item	Percent of Households					
	Calculation Errors			Consistency Errors		
	50058	50059	Total	50058	50059	Total
General Information	n/a	n/a	n/a			
Household Composition						
Net Family Assets and Income						
Allowances and Adjusted Income						
Family Rent and Subsidy Information						
Total						

Source Tables 4 and 5

Overdue Recertifications also produce errors in rents because rents are calculated using old information. We will calculate the error amount due to overdue recertification, based on the difference between Actual and QC Rent. Exhibit 5 will display the percent of cases with overdue recertifications, timely recertifications, and new certifications. This exhibit will provide this information by program type.

Exhibit 5
Timeliness of Certification Status (FY2005 and FY2006)

Rent Component	New Certifications		Timely Recertifications		Overdue Recertifications	
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
Public Housing						
PHA-administered Section 8						
Total PHA-administered						
Total Owner-administered						
Total						

Source Table 7

Our analysis will also replicate the graphics produced in the FY2005 study, illustrated by Figure 1, which shows the proportion of cases that are new certifications, timely recertifications, and overdue recertifications.

Figure 1: Case Type (FY2006)

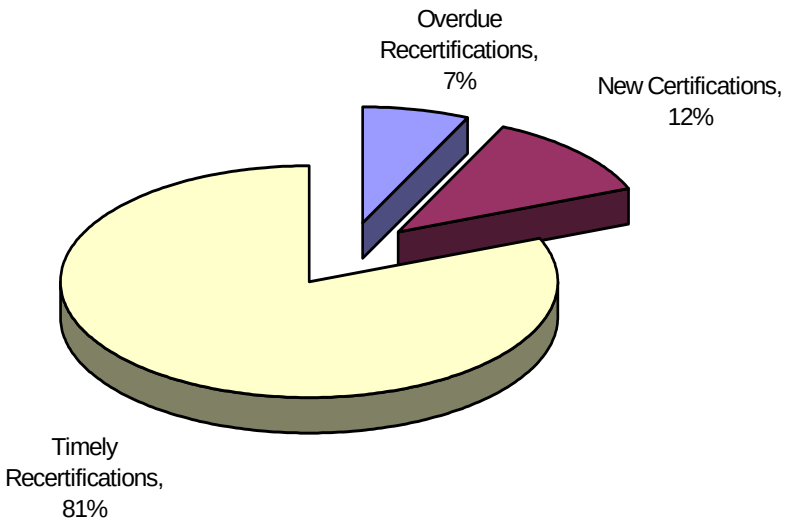

Exhibit 6 illustrates the error associated with overdue recertifications compared to errors from certification and timely recertifications. In cases with overdue recertifications, the information at the time the recertification was due will be used to determine rent, as it was in the previous studies.

Exhibit 6
Average Monthly Underpayment and Overpayment Dollar Amount
Averaged across All Households
(FY2005 and FY2006)

Action Type	Underpayment Average Dollar Amount		Overpayment Average Dollar Amount	
	FY2005	FY2006	FY2005	FY2006
New Certification				
Timely Recertification				
Overdue Recertification				
Total				

Source Table 6

As in FY2005, we will conduct additional analyses to summarize the information that addresses this objective. Exhibit 7 provides the proportion of cases with procedural error, the estimated average cost of each type of error, and the standard error of the estimated average (i.e., the variance estimate of the average). That cost will be the difference between the actual rent and the recalculated rent, using the tenant file information and correcting transcription and calculation errors.

Exhibit 7
Procedural Error: Percent of Households, Average Dollars in Error, All Households with 50058/50059 Recalculated Rent (FY2006)

Error Type	Gross Rent Error			Net Rent Error		
	Percent of Households in Error	Average Dollars in Error	Standard Error of Mean	Percent of Households in Error	Average Dollars in Error	Standard Error of Mean
Transcription Error						
Calculation Error – Allowances						
Calculation Error – Income						
Calculation Error – Other						
Overdue Recertifications						
Any Procedural Error						
All Households with Procedural Errors						

Source Table 8

Exhibit 8 provides a summary of the errors identified from the 50058/50059 forms. These data are produced using cross-tabulations and show the error rates and costs for households with each type of procedural error, for households without procedural errors, and for the total weighted sample. The exhibit presents the percent of households in error, the average dollar error, and the standard errors for both households with recalculated 50058/50059 error (error determined using only the 50058/50059 form), and households with QC Rent error.

Exhibit 8
50058/50059 Procedural Error: Percent of Households, Average Dollars in Error (FY2006)

Error Type Based on 50058/59 Recalculation	Households with Recalculated 50058/9 Error				Households with QC Rent Error			
	Percent of Households in Error	Standard Error of Percent	Average Dollar Error	Standard Error of Mean	Percent of Households in Error	Standard Error of Percent	Average Dollar Error	Standard Error of Mean
Households with Consistency Error								
Households without Consistency Error								
Households with Allowance Calculation Error								
Households without Allowance Calculation Error								
Households with Income Calculation Error								
Households without Income Calculation Error								
Households with Other Calculation Error								
Households without Other Calculation Error								
Overdue Recertifications								
On-time Recertifications								
Certifications								
Unduplicated Count, Any Type of 50058/50059 Error								
Unduplicated Count, No 50058/50059 Error								
Total								

Source Tables 4 - 8

Incorrectly applied flat rent schedule will be identified by obtaining flat rent schedules from PHAs and comparing them to the actual rent amount recorded on the 50058. This examination only applies to public housing program tenants. HUD policy requires that "for families who choose flat rents, the PHA must conduct a reexamination of family composition at least annually, and must conduct a reexamination of family income at least once every three years." [24 CFR 960.257 (a)(2)]. Therefore, multiple flat rent schedules to cover the three year period prior to the data collection effort must be obtained and documented as to when they became effective. The correct flat rent for a particular case will vary depending on when the last annual recertification was conducted. The examination of flat rents and schedules will be accompanied by a discussion of the issues identified during the analysis.

Objective 3: Estimate national-level net costs for total errors and major error types.

This analysis will replicate the cross-tabulations developed in the previous studies that address error dollars. Results from FY2005 and FY2006 will be presented for comparison. The gross rent error is obtained by adding together the absolute values of the dollar amount of overpayments to the dollar amount of underpayments. The net cost for total errors is an arithmetic calculation of the sum of positive and negative nationally weighted error costs. This sum represents the net amount of tenant payments in error and will be displayed by program type. Exhibit 9 provides this information with its associated standard error.

Exhibit 9
Gross and Net Dollar Rent Error (Monthly) for All Households
(FY2005 and FY2006)

Program Type	Gross Rent Error			Net Rent Error		
	Average Dollars in Error		Standard Error	Average Dollars in Error		Standard Error
	FY2005	FY2006	FY2006	FY2005	FY2006	FY2006
Public Housing						
PHA-administered Section 8						
Total PHA-administered						
Owner-administered						
Total						

Source Table 9

Objective 4: Determine the relationship between errors detectable by using the HUD-50058 and HUD-50059 forms and total errors found in the study.

Objective 2 estimates *procedural error* that can be attributed to mistakes made by the housing manager. Except for overdue recertifications, it does not estimate QC error detected through the verification process. The purpose of Objective 4 is to determine the relationship between those procedural errors detected from the 50058/59 forms and the total error found after all information was verified in the study. Exhibit 10 illustrates this analysis.

Exhibit 10
50058/59 Rent Calculation Error Compared to QC Rent Error
(FY2005 and FY2006)

Rent Calculation Method	Percent of Households with Correctly Calculated Rent		Percent of Households with Incorrectly Calculated Rent	
	FY2005	FY2006	FY2005	FY2006
Using Information on the 50058/50059 Form				
According to the QC Rent Calculation				
Both 50058/50059 calculation and QC Rent calculation				

Source Table 1

Since HUD collects 50058/9 forms centrally on the TRACS/PIC System, it may beneficial for the agency to re-calculate information on the 50058/9 forms to help identify cases likely to be in error. This decision could be made on the basis of the results of the descriptive analysis, or HUD may choose to use more sophisticated techniques. Additional discussion of the use of PIC and TRACS data to predict error is found under Objective 14.

Exhibit 11 presents the percent of households in error and the total annual program dollar errors, comparing error obtained from tenant file information alone to error obtained from tenant file information plus household interview information.

Exhibit 11
Percent of Households in Error and Dollar Error by Error Basis
(FY2005 and FY2006)

Error Basis	Percent of Households in Error		Total Annual Dollar Errors	
	FY2005	FY2006	FY2005	FY2006
Error based on tenant file and interview information				
Error based on tenant file information only				

Source Table 3

Objective 5: Determine whether error rates and error costs have statistically significant differences from program to program.

Regression analysis will be used to determine whether differences in error rates by programs are statistically significant. Regression models will estimate the impact of program type on gross and net dollar errors as dependent variables. The gross error rate is the sum dollar amount of gross error divided by the sum dollar amount of QC Rent, and the net error rate, which is the sum dollar amount of net error divided again by the sum dollar amount of QC Rent. The models will include two dummy variables for program type: public housing project versus PHA-administered Section 8 and owner-administered projects, and PHA-administered Section 8 projects versus public housing and owner-administered projects. Generally, if a variable has *m* categories, the model must contain *m-1* dummy variables to represent the categorical variable. The omitted category, in this case the owner-administered projects, is referred to as the reference group because the model's comparisons are

made against that program type. The estimated coefficients can be interpreted as the dollar amount of error for that program type, on average. For the omitted category (i.e., owner-administered projects), the model intercept represents the average dollar amount of error. Using the estimated coefficients, we can then calculate the average gross and net error rates for each program type. T-tests will indicate whether program differences in error are statistically significant. Exhibit 12 illustrates how these results might be displayed.

Exhibit 12
The Impact of Program Type on Gross and Net Dollar Error (FY2006)

Program Type	Average Gross Error	Average Net Error
Public Housing		
PHA-administered Section 8		
Owner-administered		

Objective 6: Determine the apparent cause of significant rent errors, either on a sample or a comprehensive basis, to provide HUD with information on whether the error was caused primarily by the tenant or by program sponsor staff.

Understanding the sources and causes of significant rent errors is important for determining corrective actions. First, it is necessary to have an understanding of which items in the rent calculation formula contribute most to error. Second, it is important to understand whether this error is caused by the tenant or by the project's administrative staff. However, it is sometimes difficult to disentangle the source and cause of errors. Transcription and calculation errors, improper application of allowances, and failure to recertify on time are procedural errors. These are clear responsibilities of the project's management and administrative staff. The cause of discrepancies between the information used to calculate rent by the project and that obtained through the QC verification process is not always clear. Tenants may have failed to report an income item because they intentionally withheld the information to pay less rent; they may not have been asked to report an item during the interview; or they may have misunderstood the requirement. For that reason, we prefer not to ascribe to the tenant all errors attributed to discrepancies between information in the project files and the QC verification process. It may often be the case that the error is due to the tenant, but this study will not be able to make that determination. Therefore, we consider discrepancies between information used to determine rent and verified information as sources of error, rather than ascribing cause to tenants or project staff.

For the purposes of analysis and corrective action, it is useful to learn which elements in the rent computation formula contribute to QC errors. Even if we don't know why items such as income or medical expenses were inaccurate, HUD will know that these items should be given more careful attention by local project staff when they obtain information from tenants and/or verify information from third parties.

We propose two levels of analysis to address this issue. First, we will provide descriptive information on the sources of discrepancies between housing file information and verified information, and describe the incidence of procedural errors and their impacts. Exhibit 7, already presented in our discussion of objective 4, describes the proportion of cases with procedural errors (i.e., calculation, transcription, improper application of allowances, improper calculation of income, and overdue certification), and their corresponding QC rent error. It shows the relationship between

these procedural errors and QC errors. Second, we will produce exhibits that illustrate another type of procedural error—*failure to verify information or inappropriate application of verification information*, as shown in Exhibits 14, 15, and 16 below. Source Table 11 will provide the data for these exhibits.

Exhibit 13 presents the number of households by rent component where verification was not obtained, where it was obtained but the verification amount did not match the amount used on the 50058/59, and where verification was obtained and it did match the amount used on the 50058/59.

Exhibit 13
Verification of 50058/50059 Rent Components
(FY2005 and FY2006)

Rent Component	No ProjectVerification		Item Verified by Project		Verification Matched 50058/59	
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
Earned Income						
Pensions						
Public Assistance						
Other Income						
Asset Income						
Dependent Allowance						
Elderly Allowance						
Child Care Allowance						
Handicapped Allowance						
Medical Allowance						

Source Table 11

Exhibit 14 provides case file verification information by program type. It displays the percent of households where the rent component was verified, as well as the percent of the verification for each rent component found in the tenant file that matched the data on the 50058/50059 form within $100.

Exhibit 14
Verification of 50058/50059 Rent Components (FY2006)

Rent Component	PHA-administered Section 8		Owner-administered		Public Housing	
	Verified	Matched*	Verified	Matched*	Verified	Matched*
Earned Income						
Pensions						
Public Assistance						
Other Income						
Asset Income						
Child Care Expense						
Disability Expense						
Medical Expense						

* Matched within $100

Source Table 13

Exhibit 15 takes the analysis a step further. It provides data on whether failure to verify sources of income and expenses was a contributor to QC error. It displays the percent of households with QC error for which verification was missing in the tenant file. Each error is presented by rent component.

Exhibit 15
QC Error Households with Missing Verification in the Tenant File
(FY2005 and FY2006)

Rent Component	50058				50059			
	Households with QC Error		Households with QC Errors and Missing Verification		Households with QC Error		Households with QC Errors and Missing Verification	
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
Earned Income								
Pensions								
Public Assistance								
Other Income								
Asset Income								
Child Care Expense								
Handicapped Expense								
Medical Expense								
No Component Error								

Source Table 11

Rent components—the elements used to calculate rent—are another source of error, so we will conduct analyses of rent component error. Exhibit 16 shows the relationship between errors in each rent component and the average dollar amount for cases in error.

Exhibit 17 compares the percent of total households with and without component error by component type and payment type. It also compares this information for households in different housing program types.

Exhibit 18 presents the standard errors for the total number of households with and without component error by component type and payment type.

Exhibit 16
Rent Components Responsible for the Largest Dollar Error
Households with Rent Error (listed by amount of dollar error)
(FY2005 and FY2006)

Rent Component	**% of Households in Error**		**Average Dollar Amount**	
	FY2005	**FY2006**	**FY2005**	**FY2006**
Earned Income				
Other Income				
Pensions				
Asset Income				
Public Assistance				
Child Care Expenses				
Medical Expenses				
Dependent Allowance				
Disability Expenses				
Elderly/Disabled Allowance				
No Rent Component Error				

Source Table 12

Exhibit 17
Income and Expense Component Error by Payment Type for All Households (FY2006)

Income/Expense Component	Underpayment			Proper Payment			Overpayment		
	PHA	Owner	Total	PHA	Owner	Total	PHA	Owner	Total
Earned Income									
Pension Income									
Public Assistance Income									
Other Income									
Asset Income									
Dependent Allowance									
Elderly Household Allowance									
Child Care Allowance									
Disability Assistance Expense									
Medical Expense									
No Rent Component Error									

Source Table 13

Exhibit 18
Percent of Households and Standard Error by Rent Component and Payment Type (FY2006)

Component	Underpayment		Proper Payment		Overpayment	
	Percent of Total Households	Standard Error	Percent of Total Households	Standard Error	Percent of Total Households	Standard Error
Earned Income						
Pension Income						
Public Assistance						
Other Income						
Asset Income						
Dependent Allowance						
Elderly/Disabled Allowance						
Child Care Expenses						
Disability Expenses						
Medical Expenses						
No Rent Component Error						

Source Table 14

Exhibit 19 will explore whether elderly/disabled and dependent allowances[4] are applied correctly.

Exhibit 19
Elderly/Disabled Allowances and Dependent Allowances (FY2006)

	Elderly Allowance			Dependent Allowance		
	Non-Elderly/ Non-Disabled Households	Elderly/ Disabled Households	All Households	Households Without Dependents	Households With Dependents	All Households
No Allowance						
Incorrect Allowance						
Correct Allowance						

Source Table 15

Additional multivariate analyses will explore associations between procedural errors and income components and QC Dollar Rent Error.

Objective 7: Determine the extent to which households are overhoused relative to HUD's occupancy standards.

This objective addresses whether households reside in units with the correct number of bedrooms. Generally acceptable standards[5] specifying the appropriate size unit for PHA Section 8 households are shown in Exhibit 20 below.

Exhibit 20
PHA Section 8 Unit Size Standards

Number of Bedrooms	Number of Persons in Household	
	Minimum	Maximum
0	1	1
1	1	2
2	2	4
3	3	6
4	5	8
5	7	10

[4] Households with an elderly or disabled head or spouse are entitled to one $400 allowance (i.e., deduction from gross annual income) in calculating rent. Households are entitled to a $480 allowance for each dependent (defined as children under 18, full-time students, and disabled members other than the head or spouse).

[5] Local projects have discretion in determining unit size, and may determine unit size differently than shown.

There are exceptions to these guidelines. If a tenant is elderly, disabled, pregnant, or meets other criteria, they may be allowed a larger bedroom unit. There are also circumstances when households are allowed smaller bedroom units. The determination of appropriate bedroom size is locally based. For this study it will be based on the *Standards*, delivered under separate cover, which specify rules for bedroom size.

Overhousing refers to tenants occupying units that exceed the bedroom size allowed by HUD regulation for their actual household size. This study will replicate the analysis completed in previous studies, identifying by bedroom size and program, the proportion of households in compliance with and in violation of occupancy standards. This analysis will be conducted with national estimates of proportions in tabular displays showing the results for FY2005 and FY2006. Exhibit 21 presents the percent of households in units with the correct number of households by program type with information for both the FY2005 and FY2006 study. Exhibit 22 presents the overall findings. The shaded cells generally indicate incorrect unit assignments.

Exhibit 21
Percent of Households in Units with Correct Number of Bedrooms
(According to Study Guidelines)
(FY2005 and FY2006)

Number of Bedrooms	PHA-administered				Owner Administered		Total	
	Public Housing		Section 8					
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
0								
1								
2								
3								
4								
5								
All Units								

Source Table 16

Exhibit 22
Percent of All Households by
Number of Bedrooms and Number of Household Members (in thousands) (FY2006)

Number of Bedrooms	Number of Household Members									
	1	2	3	4	5	6	7	8	9	10
0										
1										
2										
3										
4										
5										

Source Table 16

Objective 8: Provide information on the extent to which errors are concentrated in projects and programs.

We will determine the degree to which errors are concentrated in certain projects, as opposed to randomly distributed across the sample. On the one hand, if most errors are caused by the project staff, we would expect to find errors clustered in certain projects. On the other hand, if errors are mostly caused by the tenant, we would expect to find errors randomly distributed throughout the sample.

Using information obtained from the Project Staff Questionnaire, we will conduct multivariate analyses to explore the association between project characteristics (e.g., program type, SMSA/non SMSA location, percent of elderly tenants, management practices) and error rates. This analysis will identify how each of these variables contributes to differences in error. The results will provide HUD with information to guide the management of error rates, and will elaborate relationships between management practices and project/tenant characteristics associated with error rates.

Objective 9: Identify the percentage of newly certified tenants who were incorrectly determined eligible for program admission.

Incorrect initial eligibility determinations create long-term problems for assisted-housing programs. It is key to prudent housing management practices to correctly determine initial eligibility criteria. Eligibility for housing assistance is based on five certification criteria: family composition, citizenship, verification of Social Security numbers, signed consent forms, and low and very low income limits. This study will examine eligibility criteria and verify the accuracy of collected information. We will examine citizenship, Social Security number, consent form and low income criteria, and present results as shown in Exhibit 23, and by program type, as in Exhibit 24.

Exhibit 23
Percent of Newly Certified Households Meeting Certification Criteria (FY2006)

Certification Criteria	Percent of Households		
	Met Criterion	Did Not Meet Criterion	Unable to Determine
Citizenship			
Social Security Number			
Consent Form			
Low and Very Low Income			
Meets All Eligibility Criteria			

Source Table 17

Exhibit 24
Percent of Newly Certified Households Meeting Certification Criteria (FY2006)

Certification Criteria	Percent of Households Meeting the Criteria		
	Public Housing	PHA-administered Section 8	Owner-administered Section 8
Citizenship			
Social Security Number			
Consent Form			
Low and Very Low Income			
Meets All Eligibility Criteria			

Source Table 18

Objective 10: Determine the extent to which Section 8 voucher rent comparability determinations are found in the tenant file, and indicate the method used to support the determination. Determine whether voucher payment standards are within 90 – 110 percent of fair market rents, and determine whether the correct utility allowances are being applied.

Objective 10 examines several issues related to the Section 8 Voucher program that have important but indirect influences on rent errors.

Rent Reasonableness Analysis

To comply with the rent reasonableness requirement, housing authorities must determine that Section 8 voucher rents are reasonable in comparison to rents for similar housing in the private, unassisted market. We will determine, based on information obtained from PHAs, their usual method for assessing rent reasonableness. Exhibit 25 illustrates these results.

Exhibit 25
Rent Reasonableness Determination Methods (FY2006)

Method for Assessing Rent Reasonableness	PHAs Using Method	
	Number	Percent
Unit-to-Unit Comparison		
Unit-to-Market Comparison		
Point System		
Professional Judgment		
Other or Rent Control		
No Information Provided		
Total		

Using information collected from tenant files, we will estimate the proportion of new admission Section 8 voucher recipients with rent reasonableness documentation. We will also determine the timing of their most recent determination, and compare this to the results from FY2005. Exhibits 26 and 27 illustrate these results.

Exhibit 26
Rent Reasonableness Documents in Files for New Admissions
(FY2005 and FY2006)

Status	FY2005		FY2006	
	Units in 1000s	Percent	Units in 1000s	Percent
Determination documented				
A signed statement certifying that the rent is reasonable				
Comparable units documented by the property owner in section 12a of HUD 52517				
Comparable units documented on other documents				
Any other reference to rent reasonableness				
Missing reference				
No determination documented				
Total				

Exhibit 27
Timing of Most Recent Rent Reasonableness Determination—New Admissions
(FY2005 and FY2006)

Determination-Certification Chronology	FY2005		FY2006	
	Units in 1000s	Percent	Units in 1000s	Percent
More than 4 months before lease date				
Up to 4 months before lease date				
After lease date—up to 2 months				
After lease date—greater than 2 months				
Date missing				
Total				

Annual recertifications require rent reasonableness documents only when owners increased rental rates. We will examine case files to determine when the current rent first became effective, and whether rent reasonableness documentation is present in the files. This analysis is displayed in Exhibit 28. We will also compare timing of determinations from FY2004 and FY2005, as Exhibit 29 illustrates.

Exhibit 28
Rent Reasonableness Documents for Annual Recertifications
(FY2005 and FY2006)

Status	FY2005		FY2006	
	Units in 1000s	Percent	Units in 1000s	Percent
Determination documented				
A signed statement certifying that the rent is reasonable				
Comparable units documented by the property owner in section 12a of HUD 52517				
Comparable units documented on other documents				
Any other reference to rent reasonableness				
Missing reference				
No determination documented				
Total				

Exhibit 29
Timing of Most Recent Rent Reasonableness Determination—Annual Recertifications
(FY2005 and FY2006)

Determination-Certification Chronology	FY2005		FY2006	
	Units in 1000s	Percent	Units in 1000s	Percent
More than 4 months before lease date				
Up to 4 months before lease date				
After lease date—up to 2 months				
After lease date—greater than 2 months				
Date missing				
Total				

Payment Standards Analysis

HUD will supply the published Fair Market Rents (FMR) to ORC Macro. This information will be compared to payment standard data from the 50058 form, which will be captured during the data collection process. Household rents outside of the 90-110 percent band of the FMR will be appropriately flagged and this information will be sent to HUD. The comparison of FMRs and payment standard data will result in a table that summarizes the number and percent of households below, in, and above the 90-110 percent band. Exhibit 30 displays this.

Exhibit 30
Percent of Households by Fair Market Rent Category
After Comparing Payment Standard to Fair Market Rent (FMR; FY2006)

Fair Market Rent Category	Percent of Households		
	Under 90% FMR	90–110 % FMR	Over 110% FMR
Less than $500			
$500–$599			
$600–$799			
$800–$999			
$1,000–$1,199			
$1,FY200–or Higher			
All Voucher Households			

For households that fall outside the 90-110 band, we will determine whether they received an exemption. Exhibit 31 illustrates this analysis.

Exhibit 31
Percent of Households Meeting Payment Standard Requirements (FY2006)

	Percent of Households			Total Percent Outside the 90–110% Band
	Under 90% FMR	90–110 % FMR	Over 110% FMR	
Payment Standard Compared with Fair Market Rent				
Households Granted an Exemption				
Households (without exemptions) with Elderly or Disabled Members				
Households Not Meeting Requirements				

Utility Schedules

Voucher utility allowances will be evaluated in by comparing the utility allowance amount recorded in the tenant file utility worksheet to the utility allowance recorded on the 50058/9 form, and to the amount calculated using the PHA utility allowance schedule. Macro will obtain utility schedules in use by the PHAs and the utility allowance worksheet from the tenant file. We will compare the total utility allowance amount, the number of bedrooms, and the address. Exhibit 32 illustrates this analysis.

Exhibit 32
Households Meeting Utility Allowance Requirements (FY2006)

Outcome	Number	Percent
QC Utility Allowance Compared to 50058 Utility Allowance		
Matched		
Did not match		
Possible reasons for discrepancy: Number of bedrooms did not match Address did not match Type of unit did not match Dates did not match		
QC Utility Allowance Compared to Project Utility Allowance Schedule		
Matched		
Did not match		
Possible reasons for mismatch: Number of bedrooms did not match Type of unit did not match Dates did not match		

Objective 11: Estimate total positive and negative errors in terms of HUD subsidies.

The actual cost of errors to HUD is expressed in terms of subsidy payments. HUD subsidies for assisted housing programs equal the allowed expense level or payment standard minus the tenant rent. In the previous study, proper payments were defined as those in which the Actual Rent equals the QC Rent (i.e., there is no dollar error in the tenant payment). Errors can be either overpayments (Actual Rent greater than QC Rent) or tenant underpayments (Actual Rent less than QC Rent). Overpayment error rates are computed by dividing the total amount of overpayment by the total Actual Rent; underpayment error rates are calculated by dividing the total amount of underpayments by the total Actual Rent. Tenant overpayments are negative subsidy errors; tenant underpayments are positive subsidy errors. Tables as shown in Exhibits 33, 34 and 35 below will illustrate the results of these comparisons.

Exhibit 33
Negative Subsidy Households (Under-subsidies)
Percent of Households and Average Monthly Dollar Amount of Error
(FY2005 and FY2006)

Program Type	Percent of Households in Error		Average Dollar Amount of Error			
			Negative Subsidy Households (with errors > $5)		All Households	
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
Public Housing						
PHA-administered Section 8						
Total PHA-administered						
Total Owner-administered						
Total						

Source Tables 1b and 3

Exhibit 34
Positive Subsidy Households (Over-subsidies)
Percent of Households and Average Monthly Dollar Amount of Error
(FY2005 and FY2006)

Administration Type	Percent of Households in Error		Average Dollar Amount of Error			
			Positive Subsidy Households (with errors > $5)		All Households	
	FY2005	FY2006	FY2005	FY2006	FY2005	FY2006
Public Housing						
PHA-administered Section 8						
Total PHA-administered						
Total Owner-administered						
Total						

Source Tables 1b and 3

Exhibit 35
Average Monthly Dollar Amounts of Error for Negative (Under-) and Positive (Over-) Subsidies Averaged Across All Households
(FY2005 and FY2006)

Household Type	Negative Subsidy Average Dollar Amount of Error		Positive Subsidy Average Dollar Amount of Error	
	FY2005	FY2006	FY2005	FY2006
Certifications				
Non-overdue Recertifications				
Overdue Recertifications				
Total				

Source Tables 1b and 3

Objective 12: Determine the extent to which error rates in projects that use an automated rent calculation system differ from errors in those that do not.

Rent calculation using an automated system could eliminate calculation errors. Automated systems may also facilitate accurate collection and storage of tenant information. In the FY2005 study, we found that between 84 and 96 percent of projects used computers for various administrative processes. For the FY2006 study, we will determine (via the PSQ) the tasks for which PHAs and projects use computers (e.g., tracking certifications; conducting accounting tasks; submitting tenant information to HUD). Exhibit 36 displays this analysis.

Exhibit 36
Percent of Projects Using Computer Software for Administrative Tasks in the Past 12 Months (FY2006)

Administrative Tasks	Percent Using Computer Software			
	Public Housing Projects	PHA-Administered Section 8 Projects	Owner-Administered Projects	All Projects
Interview tenants and record answers				
Keep track of pending verifications				
Input verified information				
Calculate rent				
Print the 50058/50059 form				
Conduct accounting tasks				
Track maintenance activities				
Print letters to the tenants				
Assign recertification dates/appointments				
Print checks				
Submit tenant information to HUD				
Conduct rent reasonableness comparisons				
Maintain demographics on the population				
Keep other types of statistics				
DO NOT USE COMPUTERS				
TOTAL NUMBER OF PHA/PROJECTS				

We will also examine use of computers by project size, as illustrated by Exhibit 37.

Exhibit 37
Percent of Projects Using Computer Software Uses in the Past 12 Months, by Project Size (FY2006)

Administrative Tasks	Percent Using Computer Software		
	Projects With <150 Units	Projects With 150 To 500 Units	Projects With >500 Units
Interview tenants and record answers			
Keep track of pending verifications			
Input verified information			
Calculate rent			
Print the 50058/50059 form			
Conduct accounting tasks			
Track maintenance activities			
Print letters to the tenants			
Assign recertification dates/appointments			
Print checks			
Submit tenant information to HUD			
Conduct rent reasonableness comparisons			
Maintain demographics on the population			
Keep other types of statistics			
DO NOT USE COMPUTERS			
TOTAL NUMBER OF PHA/PROJECTS			

Objective 13: Determine whether other tenant or project characteristics on which data are available are correlated with higher or low error rates.

Many Federal and state agencies use error-prone modeling techniques to identify cases with a high probability of being in error. These techniques are often used in welfare, Medicaid, student aid, food assistance, and tax compliance programs. A variety of tools have been used, including regression analysis, sequential search techniques, discriminant analysis, correlation and regression trees (CART), and other statistical methods, depending on the nature of the available data. Ideally, these methods are used to develop equations that predict the likelihood a case is in error or an administrative unit is making errors.

Error prone models provide a cost-effective means to target quality control monitoring efforts by identifying specific types of tenants and projects likely to exhibit high error rates. We will use multivariate regression techniques, path analysis, and classification and regression trees (CART) to develop error-prone models. The dependent variable in these analyses will be rent errors. Project characteristics (e.g. PHA/project size; staff training methods) and tenant characteristics (e.g., number of sources of income; type of expenses) will be used as independent variable. Where possible, we will incorporate data from TRACS/PIC into the models to provide HUD with more information for identifying projects and tenants likely to exhibit high error rates. Although the explanatory findings of error-prone models are important, we believe that such models will be most useful to HUD if its analysts can combine the findings from program data (e.g., TRACS/PIC) to target projects and

tenants likely to exhibit high error rates. In this proposed study, our error-prone modeling efforts will focus on producing practical tools that HUD analysts can use in ongoing quality control efforts.

Objective 14: Determine whether cases for which 50058/9 data had been submitted to HUD were more or less likely to have errors than those for which data had not been submitted.

A national database of tenant 50058/9s is maintained by HUD on the TRACS/PIC system. However, not all tenants are on the system. There are concerns about projects that fail to routinely transmit information to TRACS/PIC, and it is hypothesized that a reason for this failure is that (re)certifications are not performed on a timely basis. The existence of TRACS/PIC in concert with the QC study provides the opportunity to investigate the relationship between TRACS/PIC reporting and rent accuracy.

In the FY2003 study, we found that 97 percent of study households were included in the TRACS/PIC databases. The total cost of errors was higher for the households not matched to TRACS/PIC. In the FY2004 study, TRACS/PIC matching was attempted but match results were not available.

If HUD is able to provide the data necessary to conduct the analysis, we will replicate the FY2003 analysis in the present study. We will match the sampled tenants with the TRACS and PIC databases and then produce error estimates for matched and nonmatched cases.

The analysis will compare QC error rates for sampled tenants who appear on TRACS/PIC with those who do not. Any difference that is greater than sampling error would be considered significant. The results will be presented, as shown in Exhibits 38 and 39, for program type and payment type. The total population will be used to determine the average dollars in error.

Exhibit 38
Average Dollars in Error by and TRACS/PIC Data (FY2006)

Administration Type	TRACS/PIC PRESENT		TRACS/PIC ABSENT	
	Percent of All Households in Error	Average Dollars in Error	Percent of All Households in Error	Average Dollars in Error
Public Housing				
PHA-administered Section 8				
Total PHA-administered				
Total Owner-administered				
Total				

Source Table 19

Exhibit 39
Average Dollars in Error by Payment Type and TRACS/PIC Data (FY2006)

Payment Type	TRACS/PIC PRESENT		TRACS/PIC ABSENT	
	Percent of Households in TRACS/PIC	Average Dollars in Error	Percent of Households Not in TRACS/PIC	Average Dollars in Error
Overpayment				
Underpayment				
Proper Payment				
Total				

Source Table 20

Analyses will identify the number of households where the effective date of action on the 50058/50059 used in the study matches the effective date of action in the TRACS/PIC file. For those households that match on effective date of action, we will determine whether certain key variables match. Variables included in this analysis will be gross income, net income, tenant rent, and total tenant payment (TTP). Exhibit 40 provides the percent of households where key variables on the 50058/59 forms matched the TRACS/PIC data.

Exhibit 40
Percent of Matched and Non-Matched Dollar Amounts for Key Variables
Matching Variables from the 50058/50059 Form and TRACS/PIC Data Files (FY2006)

Match Status	Gross Income		Net Income		Total Tenant Payment		Tenant Rent
	PIC	TRACS	PIC	TRACS	PIC	TRACS	PIC
No Match							
Match							
Subtotal							
Missing							
Total							

Source Table 20

The households which included variables where the 50058/50059 data did not match the TRACS/PIC data will be reviewed to determine if these households' rent was calculated in error. Exhibit 41 displays the cases with discrepancies in gross income, net income, total tenant payment, and tenant rent, and the percents that also have rent errors.

Exhibit 41
Percent of Gross Dollar Rent Errors for Cases Where Key Variables Did Not Match (FY2006)

Rent Error Status	Gross Income		Net Income		Total Tenant Payment		Tenant Rent
	PIC	TRACS	PIC	TRACS	PIC	TRACS	PIC
Rent Error							
No Rent Error							
Total							

Analysis will also be conducted to determine whether non-matching households included consistency, transcription or calculation errors within the 50058/50059. Exhibit 42 presents these households by type of error.

Exhibit 42
Percent of Procedural Errors for Cases Where Key Variables Did Not Match (FY2006)

Calculation and Consistency Error Status	Gross Income		Net Income		Total Tenant Payment		Tenant Rent
	PIC	TRACS	PIC	TRACS	PIC	TRACS	PIC
Consistency Error							
Allowance Calculation Error							
Income Calculation Error							
Other Calculation Error							
Transcription Error							

FINAL REPORT OUTLINE

The final report will communicate all study findings and recommendations to HUD, the assisted housing community, the Congress, and other interested parties. As such, it must provide accurate and clear findings in a fashion that is easy to read and understand. While many of the overall goals of the project are straightforward, the processes for addressing them may be analytically complex. The challenge in preparing the report is to present important findings without burdening the reader with all of the complexity that went into conducting the analysis. Our approach to report preparation is to use simple tabular and graphical displays that illustrate key findings.

The outline that will be followed to structure the report is presented below.

EXECUTIVE SUMMARY

I. INTRODUCTION (Purpose**,** background, and organization of the report)

II. METHODOLOGY (Requirements and study standards, sample description, data collection process, data sources, and analysis processes)

III. STUDY OBJECTIVES (Discussion of each of the study's analytic objectives)

IV. FINDINGS (Narrative, tabular, and graphical presentations of the findings)

- A. Rent Error
- B. Sources of Error
- C. Errors Detected Using Information Obtained from Project Files
- D. Occupancy Standards Analysis
- E. PIC/TRACS Analysis
- F. Project Staff Questionnaire Analysis
- G. The Impact of Project and Tenant Characteristics on Procedural Errors
- H. Rent Reasonableness Analysis
- I. Utility Allowance Analysis
- J. Flat Rent Analysis
- K. Payment Standards Analysis

V. RECOMMENDATIONS (Policy implications, and a discussion of how study methodologies can be improved)

VI. APPENDICES

- A. Rent Calculations
- B. Weighting Procedures
- C. Source Tables
- D. Consistency and Calculation Errors
- E. Project Staff Questionnaire Analysis
- F. Utility Allowance Analysis
- G. Other Technical Analysis

Appendix A

Definitions of Key Terms

Definitions

Actual TTP—from the 50058/50059

Administration Type—PHA or Owner

Aggregate Error—the difference between the actual rental payment and the QC rental payment

Case Type—certification, recertification, and overdue recertification

Dollar Error Rate—the quotient of dividing the Total Gross Rent Error by the weighted sum of the QC rents.

Case Error Rate—the quotient of dividing the sum of the weights of tenant cases with dollar error rates in excess of $5 per month by the total sum of the weights of tenant cases.

Gross Rent Error—the sum of the absolute values of under- and overpayments

Largest Dollar Error—the annual dollar amount of error in the component with the largest error

Overpayment—results when the tenant paid more than he/she should have paid; HUD's contribution was less than it should have been

Payment Type—underpayment, proper payment, and overpayment

Program Type—Public Housing, Section 8 Vouchers, Section 8 Moderate Rehabilitation, Section 8 Substantial Rehabilitation and New Construction, Section 8 Loan Management, Section 8 Property Disposition, Section 202 PRAC/PAC, and Section 811 PRAC/PAC.

Quality Control Month (QCM)—the effective date of the most recent action in the file

Quality Control (QC) Total Tenant Payment (TTP)—calculated by using the household interview and verification data

Rent Component—the five sources of income (earned, pensions, public assistance, other income, and assets) and the five types of deductions (medical, child care, disability, dependent allowance, and elderly/disabled family allowance)

Rent Dollar Error—the dollar amount of the Actual Rent minus the QC Rent for an individual tenant. A negative number indicates an underpayment, meaning the household paid less than it should and HUD’s subsidy was higher than it should have been. A positive number indicates a household overpayment, meaning HUD’s contribution was less than it should have been.

Total Gross Rent Error—the weighted sum of the absolute values of positive and negative Dollar Rent Errors.

Total Net Rent Error—the arithmetic value of the weighted sum of individual tenant Rent Dollar Errors.

Underpayment—results when the tenant paid less than he/she should have paid; HUD's contribution was higher than it should have been.

Appendix B

Source Tables Responding to Each Objective

Tables Responding to Objective(s)

OBJECTIVE	TABLE
Objective 1: Identify the various types of errors and error rates and related estimated variances.	1. Percent of Households by Payment Type and Program Type 1a. Proper payment based on exact match of actual and QC rent 1b. Proper payment based on a match of actual and QC rent within $5 2. Dollar Rent Error by Program Type 3. Dollar Error Amount by Payment Type and Program Type
Objective 2: Identify the dollar costs of the various types of errors.	4. Calculation Errors on Form 50058/59 5. Consistency Errors on Form 50058/59 6. Dollar Error Amount by Payment Type and Case Type 7. Case Type by Program Type 8. Administrative Error: percent of Households, Average Dollars in Error
Objective 3: Estimate national-level net costs for total errors and major error types.	9. Gross and Net Rent Error by Program Type
Objective 4 Determine the relationship between errors detectable using the HUD 50058 and HUD 50059 forms and total errors found in the study.	1. Percent of Households by Payment Type and Program Type 3. Dollar Error Amount by Payment Type and Program Type
Objective 5: Determine whether error rates and error costs have statistically significant differences from program to program.	9. Gross and Net Rent Error by Program Type 10. Total and Largest Dollar Error by Program Type for Households with Rent Error
Objective 6: Determine the apparent cause of significant rent errors.	11. Verification of Form 50058/59 Rent Component • Largest Component Error for Households with Rent Error • QC Rent Components by Payment Type and Administrative Type • Percent of Cases and Standard Error by Rent Component and Payment Type • Allowances Multivariate regression analysis with error sources and error causes as independent variables, and QC error as the dependent variable.
Objective 7: Determine the extent to which households are overhoused relative to HUD's occupancy standards.	16. Occupancy Standards
Objective 8: Provide information on the extent to which errors are concentrated in projects and programs.	2. Dollar Rent Error by Program Type These data are from the Project Staff Questionnaire
Objective 9: Estimate the percentage of newly certified tenants who were incorrectly determined eligible for program admission.	17. Percent of Newly Certified Households Meeting Certification Criteria 18. Percent of Newly Certified Households Meeting Certification Criteria by Program Type

OBJECTIVE	TABLE
Objective 10: Determine the extent to which Section 8 voucher rent comparability determinations are found in the tenant file, and indicate the method used to support the determination.	
Objective 11: Estimate total positive and negative errors in terms of HUD subsidies.	1. Percent of Households by Payment Type and Program Type 3. Dollar Error Amount by Program Type and Program Type
Objective 12: Determine the extent to which error rates in projects that use an automated rent calculation system differ from error rates in those that do not.	2. Dollar Rent Error by Program Type 3. Dollar Error Amount by Payment Type and Program Type
Objective 13: Determine whether other tenant or project characteristics on which data are available are correlated with high or low error rates.	Multivariate error prone analysis using tenant and project characteristics as independent variables and QC error as the dependent variable.
Objective 14: Determine whether cases for which 50058/59 data had been submitted to HUD were more or less likely to have errors than those for which data had not been submitted.	19. QC Errors by Match with TRACS/MTCS and Program 20. Payment Type by Program and Match with TRACS/MTCS

Terms: **Rent Component:** The five sources of income (earned, pensions, public assistance, other, and asset), three types of expense deductions (medical, child care, and handicapped expenses), and two allowances (dependent and elderly allowances)

Rent Error: The difference between the Actual Rent (Total Tenant Payment) and the QC Rent; net rent error is the algebraic sum of over- and underpayments; gross rent error is the sum of the absolute values of under- and overpayments.

Program Type: Public Housing, Section 8 Vouchers, Section 8 Moderate Rehabilitation, Section 8 Substantial Rehabilitation and New Construction, Section 8 Loan Management, Section 8 Property Disposition, Section 202 PRAC/PAC, Section 811 PRAC/PAC

Administration Type: PHA or Owner

Payment Type: Underpayment, proper payment, and overpayment

Case Type: Certification, annual recertification, and overdue recertification

Appendix C

National Estimates Source Tables

National Estimate Source Tables

Table 1a. Percent of Households by Payment Type by Program Type
Proper Payment based on exact match of Actual and QC Rent

	UNDERPAYMENT			PROPER PAYMENT				OVERPAYMENT				TOTAL
	# of Cases*	Row % of Cases	Col %of Cases	# of Cases*	Row % of Cases	Col %of Cases	# of Cases*	Row % of Cases	Col %of Cases	# of Cases*	Row % of Cases	Col %of Cases
PHA-Administered												
Public Housing												
PHA-Administered Sec. 8												
Group Total												
Owner-Administered												
Group Total												
Table Total												

Note: * denotes values in the thousands

Table 1b. Percent of Households by Payment Type and Program Type
Proper Payment based on a match of Actual and QC Rent Within $5

	UNDERPAYMENT			PROPER PAYMENT			OVERPAYMENT			TOTAL		
	# of Cases*	Row % of Cases	Col % of Cases	# of Cases*	Row % of Cases	Col % of Cases	# of Cases*	Row % of Cases	Col % of Cases	# of Cases*	Row % of Cases	Col % of Cases
PHA-Administered												
Public Housing												
PHA-Adminisrtered Sec. 8												
Group Total												
Owner-Administered												
Group Total												
Table Total												

Note: * denotes values in the thousands

Table 2. Dollar Rent Error by Program Type

	ACTUAL RENT (MONTHLY)				QC RENT (MONTHLY)				GROSS RENT ERROR (MONTHLY)		
	# of Cases* (1)	Col % of Cases	Sum Dollar Amount* (2)	Ave. Dollar Amount (2)/(1)	# of Cases*	Col % of Cases	Sum Dollar Amount * (3)	Ave. Dollar Amount (3)/(1)	Sum Dollar Amount* (4)	Ave. Dollar Amount* (4)	Error Rate
PHA-Administered											
Public Housing											
PHA-Adminisrtered Sec. 8											
Group Total											
Owner-Administered											
Group Total											
Table Total											

Note: * denotes values in the thousands

Table 3. Dollar Error Amounts by Payment Type and Program Type

	UNDERPAYMENT (MONTHLY)				OVERPAYMENT (MONTHLY)				QC RENT (MONTHLY)			
	# of Cases*	Col % of Cases	Sum Dollar Amount* (1)	Ave. Dollar Amount (1) / (3)	# of Cases *	Col % of Cases	Sum Dollar Amount* (2)	Ave. Dollar Amount (2) / (3)	# of Cases* (3)	Col % of Cases	Sum Dollar Amount* (4)	Ave. Dollar Amount (4) / (3)
PHA-Administered												
Public Housing												
PHA-Adminisrtered Sec. 8												
Group Total												
Owner-Administered												
Group Total												
Table Total												

Table 4. Calculation Errors on Form 50058/59

	FORM				Total Number of Cases	
	50058		50059			
	# of Cases*	Col %of Cases	# of Cases*	Col %of Cases	# of Cases*	Col % of Cases
Age						
Number of Family Members						
Number of Foster Children & Live-in						
Number of Dependents						
Total Assets						
Imputed Asset Income						
Earned Income Sum						
Pension, Etc., Income Sum						
Public-Assistance Income Sum						
Asset Income Sum						
Other Income Sum						
Total Non-asset Income						
Income From Asset						
Total Annual Income						
Elderly/Disabled Allowance						
Dependent Allowance						
3% of Annual Income						
Medical Allowance						
Disability Allowance						
Child Care Allowance						
Total Allowance						
Adjusted Annual Income						
Gross Rent						
Total Tenant Payment						
Tenant Rent						
Table Total						

Note: * denotes values in the thousands

Table 5. Consistency Errors on Form 50058/59

ITEM	50058		50059		Total	
	# of Errors*	# of Cases*	# of Errors*	# of Cases*	# of Errors*	# of Cases*
General Information						
Household Composition						
Net Family Assets and Income						
Allowances & Adjusted Income						
Family Rent and Subsidy Information						
Flat Rent Schedule Information (PH only)						

Note: * denotes values in the thousands

Table 6. Dollar Error Amount by Payment Type and Case Type

	UNDERPAYMENT (MONTHLY)				OVERPAYMENT (MONTHLY)				QC RENT (MONTHLY)			
	# of Cases*	Col % of Cases	Sum Dollar Amount*	Ave. Dollar Amount	# of Cases*	Col % of Cases	Sum Dollar Amount*	Ave. Dollar Amount	# of Cases*	Col % of Cases	Sum Dollar Amount*	Ave. Dollar Amount
Certification												
Group Total												
Recertification												
Non-Overdue												
Overdue												
Group Total												
Table Total												

Note: * denotes values in the thousands

Table 7. Case Type by Program Type

	CERTIFICATIONS			RECERTIFICATIONS/ NON-OVERDUE			RECERTIFICATIONS/OVERDUE			TOTAL		
	# of Cases*	Row % of Cases	Col % of Cases	# of Cases*	Row % of Cases	Col % of Cases	# of Cases*	Row % of Cases	Col % of Cases	# of Cases*	Row % of Cases	Col % of Cases
PHA-Administered												
Public Housing												
PHA-Administered Sec. 8												
Group Total												
Owner-Administered												
Group Total												
Table Total												

Note: * denotes values in the thousands

Table 8. Administrative Error: Percent of Households, Average Dollars in Error

Error Type	GROSS RENT ERROR (MONTHLY)				NET RENT ERROR (MONTHLY)				QC RENT (MONTHLY)			
	# of Cases* (1)	Col % of Cases	Sum Dollar Amount * (2)	Ave. Dollar Amount (2) / (1)	# of Cases * (3)	Col % of Cases	Sum Dollar Amount * (4)	Ave. Dollar Amount (4) / (3)	# of Cases * (1)	Col % of Cases	Sum Dollar Amount* (5)	Ave. Dollar Amount (4) / (3)
Transcription Errors												
Calculation Errors - Allowances												
Calculation Errors - Income												
Calculation Errors - Other												
Overdue Recertifications												
Any Administrative Errors												

Note: * denotes values in the thousands

Table 9. Gross and Net Rent Error by Program Type

	GROSS RENT ERROR (MONTHLY)				NET RENT ERROR (MONTHLY)				QC RENT (MONTHLY)			
	# of Cases * (1)	Col % of Cases	Sum Dollar Amount * (2)	Ave. Dollar Amount (2) / (1)	# of Cases* (3)	Col % of Cases	Sum Dollar Amount * (4)	Ave. Dollar Amount (4) / (3)	# of Cases* (5)	Col % of Cases	Sum Dollar Amount * (6)	Ave. Dollar Amount (6) / (5)
PHA-Administered												
Public Housing												
PHA-Adminisrtered Sec. 8												
Group Total												
Owner-Administered												
Group Total												
Table Total												

Note: * denotes values in the thousands

Table 10. Total and Largest Dollar Error by Program Type for Households with Rent Errors

	TOTAL DOLLAR IN ERROR				LARGEST DOLLAR ERROR			
	# of Cases*	Col % of Cases	Sum Dollar Amount*	Ave. Dollar Amount	# of Cases*	Col % of Cases	Sum Dollar Amount*	Ave. Dollar Amount
PHA-Administered								
Public Housing								
PHA-Administered Sec. 8								
Group Total								
Owner-Administered								
Group Total								
Total								

Note: * denotes values in the thousands

Table 11. Verification of Form 50058/59 Rent Component Provided for Each Major Program Type

Third Party Verbal or in Writing, or Documentation

RENT COMPONENT	NO VERIFICATION		VERIFICATION				TOTAL	
			Dollar Amt. Not Matched		Dollar Amt. Matched			
	# of Cases*	Row %of Cases	# of Cases*	Row %of Cases	# of Cases*	Row %of Cases	# of Cases*	Row %of Cases
Earned Income								
Pension, Etc.								
Public Assistance								
Other Income								
Asset Income								
Elderly/Disabled Allowance								
Child Care Allowance								
Disabled Allowance								
Medical Allowance								

Note: * denotes values in the thousands

Table 12. Largest Component Error for Households with Rent Error (Annual Dollars)

RENT COMPONENT	# of Cases*	Col %of Cases	Sum Dollar Amount*	Ave. Dollar Amount
Earned Income				
Pension, Etc.				
Public Assistance				
Other Income				
Asset Income				
Dependent Allowance				
Elderly Allowance				
Child Care Allowance				
Handicapped Allowance				
Medical Allowance				
No Error				
Total				

Note: * denotes values in the thousands

Table 13. QC Rent Components by Payment Type and Administration Type

RENT COMPONENT	PHA-ADMINISTERED			OWNER-ADMINISTERED			TOTAL		
	# of Cases*	Col %of Cases	Row % of Cases	# of Cases*	Col %of Cases	Row % of Cases	# of Cases*	Col %of Cases	Row % of Cases
Underpayment									
Earned Income									
Pension, Etc.									
Public Assistance									
Other Income									
Asset Income									
Dependent Allowance									
Elderly/Disabled Allowance									
Child Care Allowance									
Disability Allowance									
Medical Allowance									
No Error									
Proper Payment									
Earned Income									
Pension, Etc.									
Public Assistance									
Other Income									
Asset Income									
Dependent Allowance									
Elderly/Disabled Allowance									
Child Care Allowance									
Disability Allowance									
Medical Allowance									
No Error									
Overpayment									
Earned Income									
Pension, Etc.									
Public Assistance									
Other Income									
Asset Income									
Dependent Allowance									
Elderly/Disabled Allowance									
Child Care Allowance									
Disability Allowance									
Medical Allowance									
No Error									
Total w/Rent Error Calc									

Note: * denotes values in the thousands

Table 14. Percent of Cases and Standard Error by Rent Component and Payment Type

RENT COMPONENT	% PHA-ADMINISTERED			% OWNER-ADMINISTERED			TOTAL		
	# of Cases*	% of Total Cases	SE (%)	# of Cases*	% of Total Cases	SE (%)	# of Cases*	% of Total Cases	SE (%)
Underpayment									
Earned Income									
Pension, Etc.									
Public Assistance									
Other Income									
Asset Income									
Dependent Allowance									
Elderly/Disabled Allowance									
Child Care Allowance									
Disability Allowance									
Medical Allowance									
No Error									
Proper Payment									
Earned Income									
Pension, Etc.									
Public Assistance									
Other Income									
Asset Income									
Dependent Allowance									
Elderly/Disabled Allowance									
Child Care Allowance									
Disability Allowance									
Medical Allowance									
No Error									
Overpayment									
Earned Income									
Pension, Etc.									
Public Assistance									
Other Income									
Asset Income									
Dependent Allowance									
Elderly/Disabled Allowance									
Child Care Allowance									
Disability Allowance									
Medical Allowance									
No Error									

Note: * denotes values in the thousands

Table 15. Allowances

ELDERLY/DISABLED ALLOWANCE

	NONELDERLY/DISABLED HH			ELDERLY/DISABLED HH			TABLE TOTAL		
	# of Cases*	Col %of Cases	Row % of Cases	# of Cases*	Col %of Cases	Row % of Cases	# of Cases*	Col %of Cases	Row % of Cases
No Allowance									
Incorrect Allowance									
Correct Allowance									
Table Total									

Note: * denotes values in the thousands

DEPENDENT ALLOWANCE

	HH W/OUT DEPENDENT			HH W/DEPENDENT			TABLE TOTAL		
	# of Cases*	Col %of Cases	Row % of Cases	# of Cases*	Col %of Cases	Row % of Cases	# of Cases*	Col %of Cases	Row % of Cases
No Allowance									
Incorrect Allowance									
Correct Allowance									
Table Total									

Note: * denotes values in the thousands

Table 16. Occupancy Standards

Number of Bedrooms	Public Housing				PHA-Administered Section 8				Owner-Administered				Table Total
	Under-housed	Correct	Over-housed	Group Total	Under-housed	Correct	Over-housed	Group Total	Under-housed	Correct	Over-housed	Group Total	
	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*	# of Cases*
0													
1													
2													
3													
4													
5													
Table Total													

Note: * denotes values in the thousands

Table 16. Occupancy Standards (cont'd)

Percent of Cases

Number of Bedrooms	Public Housing			PHA-Administered Section 8			Owner-Administered		
	Under-housed	Correct	Over-housed	Under-housed	Correct	Over-housed	Under-housed	Correct	Over-housed
0									
1									
2									
3									
4									
5									
Table Total									

Table 17. Percent of Newly Certified Households Meeting Certification Criteria

	MET CRITERION		DID NOT MEET CRITERION	
	# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
Citizenship				
Social Security Number				
Consent Form				
Low and Very Low Income				
Meets All Eligibility Criteria				

Table 18. Percent of Newly Certified Households Meeting Certification Criteria by Program Type

		MET CRITERION		DID NOT MEET CRITERION	
		# of Cases (in 1,000)	% of Cases	# of Cases (in 1,000)	% of Cases
PUBLIC HOUSING	Citizenship				
	Social Security Number				
	Consent Form				
	Low and Very Low Income				
	Meets All Eligibility Criteria				
PHA-ADMINISTERED SECTION 8	Citizenship				
	Social Security Number				
	Consent Form				
	Low and Very Low Income				
	Meets All Eligibility Criteria				
OWNER-ADMINISTERED	Citizenship				
	Social Security Number				
	Consent Form				
	Low and Very Low Income				
	Meets All Eligibility Criteria				

Table 19. QC Errors by Match with TRACS/PIC and Program

50058/9 DATA ON TRACS/PIC	PERCENT OF CASES				
	HOUSING AUTHORITY MANAGED			OWNER ADMINISTERED	TOTAL
	Public Housing	Section 8	Subtotal PHA Administered		All Projects
Matched With TRACS/PIC					
% Cases in Error					
Average Payment Error					
Std. Error of Mean					
Nonmatch with TRACS/PIC					
% Cases in Error					
Average Payment Error					
Std. Error of Mean					
Table Total					
% Cases in Error					
Average Payment Error					
Std. Error of Mean					

Table 20. Payment Type by Program and Match with TRACS/PIC

	UNDERPAYMENT			PROPER PAYMENT			OVERPAYMENT			TOTAL		
	# of Cases (in 1,000)	Row % of Cases	Col % of Cases	# of Cases (in 1,000)	Row % of Cases	Col % of Cases	# of Cases (in 1,000)	Row % of Cases	Col % of Cases	# of Cases (in 1,000)	Row % of Cases	Col % of Cases
PHA-Administered												
TRACS/PIC Present												
TRACS/PIC Absent												
Public Housing												
TRACS/PIC Present												
TRACS/PIC Absent												
Section 8												
TRACS/PIC Present												
TRACS/PIC Absent												
Owner-Administered												
TRACS/PIC Present												
TRACS/PIC Absent												
Total												
TRACS/PIC Present												
TRACS/PIC Absent												
Table Total												