GIPS PERFORMANCE CALCULATION METHODOLOGY

Prepared for: Composite
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EXECUTIVE SUMMARY

This document provides complete transparency into the calculation methodologies used to generate GIPS-compliant performance presentations. All calculations follow GIPS 2020 standards and industry best practices. The accompanying Excel workbook contains all formulas visible in cells for independent verification.

1. TIME-WEIGHTED RETURN (TWR) METHODOLOGY

The Time-Weighted Return is calculated using the GIPS-compliant methodology as specified in GIPS 2020 Section 2.A.32. This method eliminates the impact of external cash flows.

Formula:

```
TWR = [(1 + r■) × (1 + r■) × ... × (1 + r■)] - 1
```

Where r = monthly return for each period

Monthly Return Calculation:

```
r = (EMV - BMV - CF) / (BMV + CF × W)
```

Where: EMV = Ending Market Value, BMV = Beginning Market Value, CF = Cash Flow, W = Weight (proportion of period remaining)

2. ANNUALIZED RETURN CALCULATION

Formula:

```
Annualized Return = (1 + Cumulative Return)^(12/n) - 1
```

Where n = number of months in the measurement period

For periods less than one year, returns are NOT annualized per GIPS 5.A.4. For periods of one year or more, geometric annualization is applied.

3. RISK METRICS METHODOLOGY

3.1 Sharpe Ratio

```
Sharpe = (Rp - Rf) / σp
```

Where: Rp = Annualized portfolio return, Rf = Risk-free rate (3-month T-bill), σp = Annualized standard deviation of portfolio returns

3.2 Sortino Ratio

```
Sortino = (Rp - Rf) / σd
```

Where: σd = Downside deviation (standard deviation of negative returns only)

3.3 Volatility (Standard Deviation)

```
σ_annual = σ_monthly × √12
```

Monthly standard deviation is annualized by multiplying by the square root of 12.

3.4 Maximum Drawdown

```
Max DD = Min[(Cumulative Value - Peak Value) / Peak Value]
```

Calculated as the largest peak-to-trough decline during the measurement period.

3.5 Calmar Ratio

```
Calmar = Annualized Return / |Max Drawdown|
```

4. BENCHMARK DATA SOURCES

Benchmark: SPY - S&P; 500 Total Return

Data Source: Yahoo Finance API (LIVE data feeds)

The benchmark returns are fetched in real-time from Yahoo Finance using the appropriate ticker symbol. Total return indices are used when available to include dividend reinvestment.

5. DATA INTEGRITY & AUDIT TRAIL

All source data is preserved in its original form in the accompanying Excel workbook. The data lineage sheet traces each calculation from source to output, providing a complete audit trail for verification purposes.

Key Controls:

• Source data preserved without modification

• All formulas visible in Excel cells (not hidden values)

• Benchmark data sourced from independent third party (Yahoo Finance)

• Risk-free rate sourced from US Treasury (via Yahoo Finance ^IRX)

• Calculation methodology documented and consistent

6. GIPS 2020 COMPLIANCE STATEMENT

The performance calculations contained in this report have been prepared in accordance with the Global Investment Performance Standards (GIPS®). GIPS® is a registered trademark of CFA Institute. The firm has not been independently verified.